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# **Dico Oil Company Removal Assessment Report**

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**Contract No.: 68-W-01-012  
TDD No.: 090305-0002  
Job No.: 001275.0346.01RP**

**October 2003**

**Prepared for:  
U.S. Environmental Protection Agency, Region IX**

**Prepared by:  
Ecology and Environment, Inc.**

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# List of Acronyms

<b>AST</b>	aboveground storage tank
<b>bgs</b>	below ground surface
<b>CAO</b>	Corrective Action Order
<b>CERCLA</b>	Comprehensive Environmental Response Compensation and Liability Act
<b>CFR</b>	Code of Federal Regulations
<b>DHS</b>	California Department of Health Services
<b>DTSC</b>	California Environmental Protection Agency Department of Toxic Substance Control
<b>E &amp; E</b>	Ecology & Environment, Inc.
<b>FOP</b>	Facility Operations Plan
<b>FOSC</b>	Federal On-Scene Coordinator
<b>FRU</b>	Financial Responsibility Unit
<b>GPS</b>	global positioning system
<b>ISD</b>	Interim Status Document
<b>LARWQCB</b>	Los Angeles Regional Water Quality Control Board
<b>mg/kg</b>	milligrams per kilogram
<b>OSWER</b>	Office of Solid Waste and Emergency Response
<b>PCB</b>	polychlorinated biphenyls
<b>PID</b>	photo ionization detector
<b>PRG</b>	preliminary remediation goal
<b>QASP</b>	quality assurance sampling plan

**RCRA** Resource Conservation and Recovery Act

## **List of Acronyms (Cont.)**

<b>ROV</b>	Report of Violation
<b>SCL</b>	Southern California Laboratory
<b>START</b>	Superfund Technical Assessment and Response Team
<b>SVOC</b>	semi-volatile organic compounds
<b>SWMU</b>	solid waste management unit
<b>TSCA</b>	Toxic Substance Control Act
<b>TPH</b>	total petroleum hydrocarbons
<b>TPH-d</b>	total petroleum hydrocarbons as diesel
<b>µg/kg</b>	micrograms per kilogram
<b>USEPA</b>	United States Environmental Protection Agency
<b>USTs</b>	Underground Storage Tanks
<b>VOCs</b>	volatile organic compounds
<b>VSI</b>	visual site inspection



# 1

## Introduction

On May 2, 2003, United States Environmental Protection Agency (USEPA) Federal On-Scene Coordinator (FOSC) Craig Benson tasked Ecology and Environment, Incorporated's (E & E's) Superfund Technical Assessment and Response Team (START) to conduct a Removal Assessment at the Dico Oil Company (Dico). The California Environmental Protection Agency Department of Toxic Substances Control (DTSC) requested USEPA assistance based on previous data that polychlorinated biphenyls (PCBs) were present in soils and possibly Above ground storage tank (AST) *sludges abandoned at the site*. *START activities performed under this TDD were the following:*

- Conducting file reviews at state agencies
- Participating in interviews to determine the previous site activities and regulatory enforcement
- Conducting an initial site reconnaissance
- Determining whether sufficient data exists to conduct a Removal Action
- Performing a judgmental sampling event at key locations at the site to generate data for decision purposes

### 1.1 Site Location and Description

The site is located at 1845 East Willow Street in Signal Hill, Los Angeles County, California ([site] see Figure 1). Alternate addresses of the site include 2700 Rose Avenue, Signal Hill, and 2623 Gardenia Avenue, Signal Hill. The coordinates of the site are 33° 48' 21.7 N", 118° 10'07.1 W" (United States Geological Survey [USGS] 1981). The site occupies an area of approximately 0.5 acres, with dimensions of 90 by 240 feet.

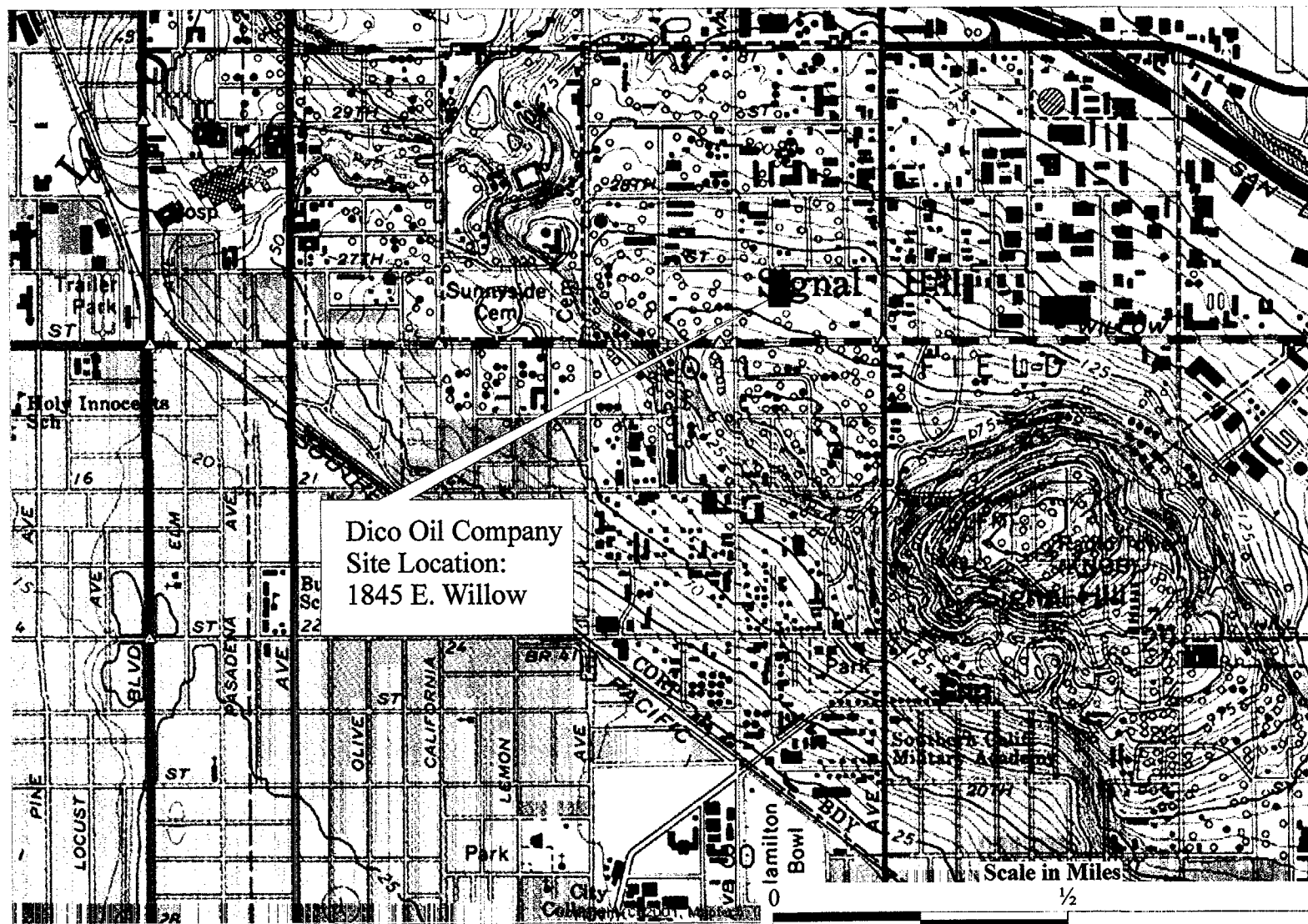
The site is located in a largely commercial zone, with land use including retail outlets, office buildings, light industry, oil production, and residences (see Figure 2). The site is bound to the



## **1. Introduction**

north by a prefabricated industrial/office park. The site is bound to the east by two residences and a parcel leased to Abbott Used Oil Company and Pearce AST Lines for office space and truck parking; these properties are owned by Luis Marmol, the current owner of the former Dico. The site is bound to the south by a retail business and associated parking lot. The site is bound to the west by an undeveloped lot used primarily for oil production by Signal Hill Petroleum.

The site consisted of an AST farm, a truck pad, a laboratory, and tool sheds. The tank farm had three large, steel ASTs in a partially bermed containment area (identified as T2, T3, and TB in Figure 2). The south side of the berm had been removed prior to the START site visit along with several cubic yards of soil. The truck pad was a concrete drive with a concrete secondary containment depression and a sump at the loading point. A laboratory building was previously located north of the tank farm. A tool shed to the north of the laboratory contains several drums with unidentified contents. The facility was not in operation and, it was heavily overgrown with vegetation.



Superfund Technical Assessment and Response Team  
ecology and environment, Inc.  
Source: USGS, 1981

Figure 1: Site Location Map  
Dico Oil Company  
Signal Hill, Los Angeles County, California



Area of Site  
Location Map



TDD:09 03-05-0002  
JOB: 001275.0346.01.RS

Industrial/ Office Park

Oil Production/ Undeveloped  
(Signal Hill Petroleum)

Abbot Used Oil Company/  
Pearce Tank Lines  
(Office and Parking)

Two-stage  
Tank

T5

Tool Shed

Tool  
Shed

Laboratory

2627 Gardenia  
(residence)

2623 Gardenia  
(residence)

TB

Tank Farm

T2

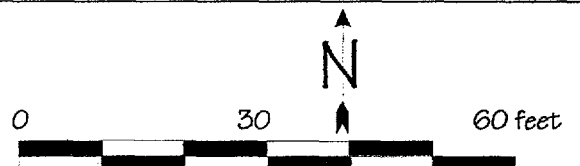
T3

Excavated Area

- Current AST Location
- Fence Line
- Tank Farm Boundary (approximate)

Retail Stores and Parking Area

Figure 2: Site Features Map  
Dico Oil Company  
Signal Hill, Los Angeles County, CA





## 1. Introduction

### 1.2 Site History

The site was originally improved by the TCL Corporation in 1952, which operated at the site between 1952 and 1958. The Western Oil Reduction Company operated at the site from 1958 to 1960. Dico, under ownership of Mr. Richard Cowan, operated the facility from 1960 to approximately 1995. Between 1995 and August 2000, Mr. Cowan owned the site, but no Dico operations were conducted. The site has been vacant of operations, but not structures since 1995.

Between August 2000 and November 2001, Mr. Herman Acevedo was the sole owner of the property. Between November 2001 and July 2003, Mr. Acevedo and Mr. Luis Marmol each owned 50% of the site as part of a business partnership. In approximately July 2003, Mr. Marmol became the sole owner of the site.

Dico operated a process storage and petroleum dehydration facility at the site. Asphalt emulsions, crude oil, diesel fuels, waste oils, and light to heavy fuel oils contaminated with water and solids were accepted (E & E, 1988) from various sources and placed into six steel ASTs. After separation, the water was siphoned off into two 10,800 gallon steel-lined pits located near the northern boundary of the tank farm. The steel-lined pits have also been described as underground storage tanks (USTs) or halves of USTs lining a pit. Wastewater was hauled off-site by various handlers to TCL Terminal Island, Palos Verdes Landfill, BKK Landfill, and Crosby and Overton. Reclaimed oil was sold as bunker oil (ship fuel). According to Mr. Cowan, as documented in a previous investigation report, sludges were not removed from the site for over twenty years (E & E, 1988).

According to Dico's Facility Operation Plan (FOP), the facility accepted only crude oils, residual and cracked fuel oils, diesel fuels, jet fuels, kerosenes and stoddard solvents, and waste/used oils. Chlorinated solvents, paint thinners, chemical degreasers, or chemical solvents were specifically not accepted. The FOP specifies the receiving procedures, which included testing and inspecting representative samples. These tests included gravity, centrifuge, flashpoint, inappropriate odors, solubility, and pH (Dico, 1986). No quantitative analytical data were generated for the presence of trace chlorinated solvents (DTSC, 1993).

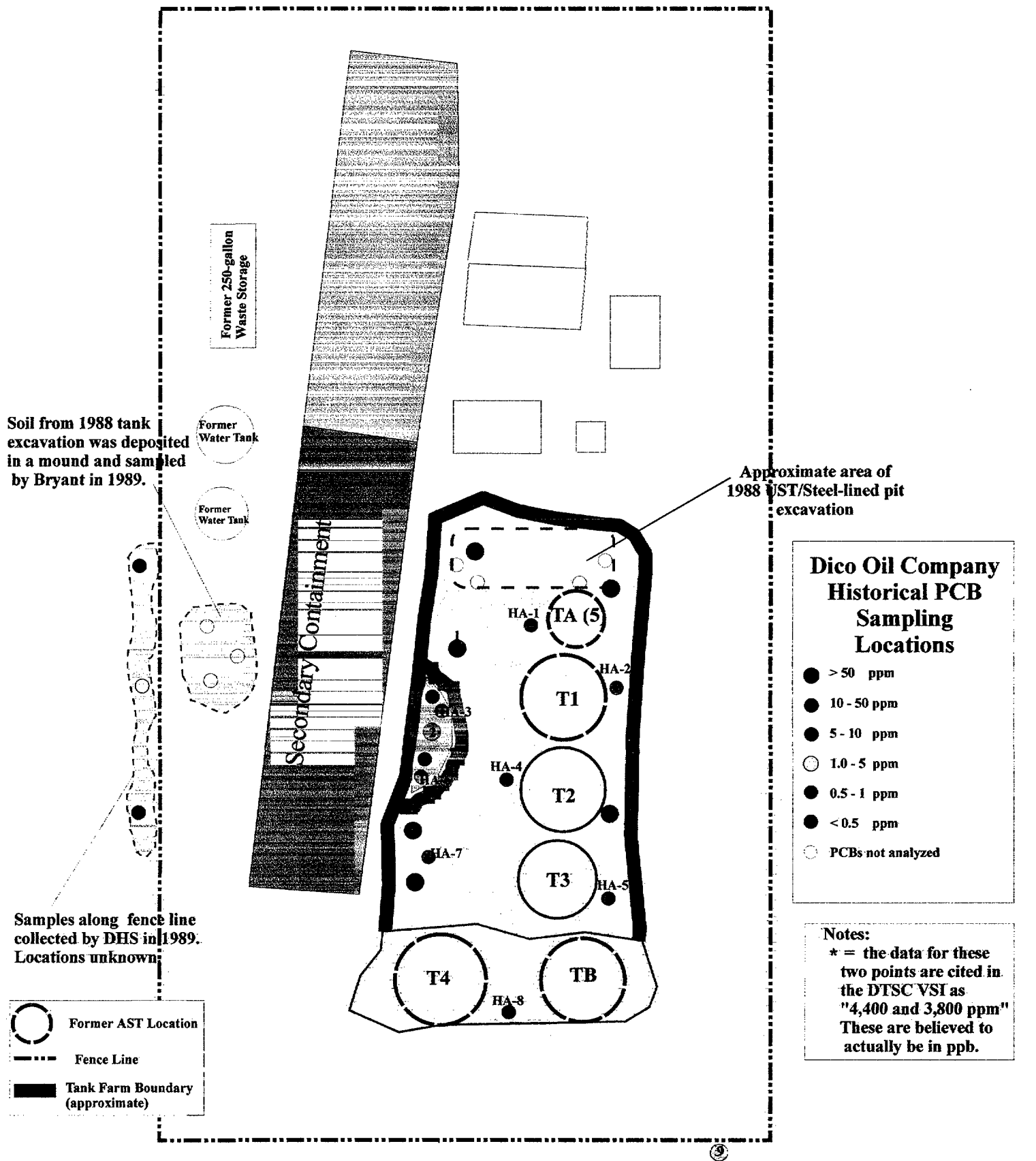
# 2

## Records Review

FOSC Benson tasked the START to conduct a records review at the DTSC to gather historical site data. The following environmental investigation history, regulatory permitting information and enforcement history summary was obtained by the START during a file review at the DTSC.

### 2.1 Environmental Investigation History

In 1988, two steel-lined waste pits were removed from the north end of the tank farm (Ball, 1988). Dico's removal contractor excavated soils under the waste pits to a depth of 15 feet below ground surface (bgs). Analytical results of soil samples collected from the walls of the excavation indicated total petroleum hydrocarbons (TPH) concentrations from 20 to 945 milligrams per kilogram (mg/kg) between 10 and 15 feet bgs. A summary of all historical analytical data for Dico is presented in Appendix A. The contaminated soils from the excavation remained on-site and were eventually added to the secondary containment berm located around the tank farm and along the western fence line (DTSC, 1989) (see Figure 3).



## 2. Records Review

In 1989, the Los Angeles Regional Water Quality Control Board (LARWQCB) ordered Dico to test the excavated soil to determine whether it should be removed from the site. The analytical data indicated a TPH concentration of 44,000 mg/kg, a chromium concentration of 37 mg/kg, and a lead concentration of 340 mg/kg (E & E, 1990).

Results for three soil samples, dated January 1990 and collected by representatives from the State of California Department of Health Services (DHS) during a September 1989 facility inspection measured concentrations of polychlorinated biphenyls (PCBs) as aroclors ranging from 1.4 to 180 mg/kg (see Figure 3). The samples were collected from soil excavated during the 1988 tank removal and the western fence line (DHS, 1989).

In 1993, the DTSC collected samples from a trench excavation around the piping inside the tank farm. The DTSC reported that the PCB concentrations of the samples were 4,400 and 3,600 mg/kg (DTSC, 1994a). Based on a review of all historical site data, it is believed that these units may have been reported in error. It is likely that the results should have been reported in micrograms per kilogram ( $\mu\text{g/kg}$ ).

During a 1994 Visual Site Inspection (VSI), the DTSC collected eight surface soil samples and one background sample, which were analyzed for TPH, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and PCBs. The VSI identified 19 potential Solid Waste Management Units (SWMUs) for future assessment, cleanup, and closure action goals (DTSC, 1994a). The results of the VSI sampling event, reported in a Resource Conservation and Recovery Act (RCRA) Facility Assessment Report (DTSC, 1994b), confirmed VOCs were present at seven sample locations, SVOCs were present at three sampling locations, lead was present at one sampling location, TPH was present at five sampling locations, and PCBs were present at four sampling locations. VOCs, TPH and PCBs were detected in the background sample location, southeast of the site boundary.

Dico's consultant, Geological Research, Inc., completed eight soil borings in 1994 to delineate the extent of subsurface contamination at the site (Geological Research, 1994). Soil samples were collected from the borings at 3, 6, and 9-foot intervals. Samples were analyzed for VOCs, metals, TPH as diesel (TPH-d), and PCBs. PCBs were detected in four borings at three and 6 feet bgs



## 2. Records Review

and two borings at 9 feet bgs. TPH-d was also detected in four borings at 3 and 6 feet bgs and one boring at 9 feet bgs. VOCs were detected in four borings at 3 feet bgs, five borings at 6 feet bgs, and two borings at 9 feet bgs. Chromium was detected in one boring at 3 feet bgs and two borings at 9 feet bgs. Lead was detected in one boring at 6 feet bgs.

The DTSC records do not include information after 1995 and the LARWQCB has no record of the site. Based on the START inspection of the facility, two ASTs have been removed from the facility and several cubic yards of soil have been removed from the south end of the tank farm since the 1994 DTSC reports. In addition, two ASTs have been moved: one is now outside the tank farm, and the other is located at the north end of the tank farm.

### 2.2 Regulatory Permitting History

The following is a summary of the regulatory permitting history summarized from the DTSC file review.

- |         |  |
|---------|--|
| 8/24/84 | The USEPA sent a letter to Dico advising that the agency had approved Dico's request for recession of their transporter status. The USEPA advised Dico of its status as a RCRA-exempt oil recycler.      |
| 4/17/85 | Dico submitted an application to the DHS for an Interim Status Document (ISD) to receive, store, treat or recycle used oil.  |
| 5/13/85 | Dico submitted an application to the LARWQCB for a waste discharge permit.   |
| 3/29/89 | The DHS issued an ISD to Dico. This ISD allowed Dico to recycle oil on-site under the condition that the facility would meet financial responsibility requirements within 60 days.                       |
| 7/30/93 | The LARWQCB rescinded Dico's waste discharge permit because the facility no longer engaged in waste discharge to the city sewage system.   |
| 4/29/94 | The DTSC issued an initial completeness review letter to Dico for their Part B Permit application. The letter requested Dico to amend and resubmit their application due to an inadequate facility plan. |



## 2. Records Review

- |          |  |
|----------|--|
| 4/17/95  | The DTSC notified Dico of its intent to deny a RCRA Part B permit.   |
| 6/19/95  | The DTSC issued the final permit decision to deny Dico's RCRA Part B permit.   |
| 09/01/03 | The USEPA prepared Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Time-Critical Removal Action Memorandum. |
| 09/01/03 | The USEPA filed a Unilateral Administrative Order for the Performance of a Removal Action at Dico.                                       |

### 2.3 Enforcement History

The following is summary of the enforcement history at the site summarized from the DTSC file review.

- |         |   |
|---------|---|
| 5/20/85 | DHS conducted an inspection at Dico and observed record violations, including the lack of the following documents: a written inspection schedule, a waste analysis plan, a contingency plan, personnel training records, a closure plan, and financial responsibility assurance.                        |
| 6/6/85  | DHS conducted an inspection and observed Class I violations including incomplete operating records and the lack of a written inspection schedule, annual report, financial responsibility, closure plan, record of waste analysis and personnel training records; inadequate contingency plan and waste |
| 2/4/86  | The City of Signal Hill notified the DHS that Dico appeared to be operating its facility without secondary containment of spills or leaks. The City requested DHS to investigate and supply the City with a report.   |
| 2/9/86  | An inspector from the LARWQCB investigated Dico and found possible petroleum contamination in the soil. A letter was sent to Dico requesting a site assessment.   |



## 2. Records Review

- 1/2/87 Dico responded to the LARWQCB by submitting a site assessment plan. Dico also reported that one AST on the facility had been removed.
- 9/29/87 DHS representatives conducted an inspection at Dico in response to a complaint alleging that Dico was accepting non-RCRA waste without a permit. Samples were obtained from the facility and analyzed at Southern California Laboratory (SCL). The analyses revealed the waste oil to be hazardous. Additionally, violations were found due to the following missing documentation and site conditions:
- financial assurance
  - waste analysis plan
  - security, warning signs posted
  - inspection records
  - personnel training records
  - communication/alarm system arrangements with local authorities
  - annual reports
  - written closure plan and cost estimate
  - inadequate contingency plan and operating records
  - uncovered and unlabeled containers of hazardous waste
- 10/19/87 Dico submitted to DHS a letter responding to the inspection of September 29, 1987. Dico contended that the documents alleged to be missing during the inspection had been submitted to the DHS in 1986 and described other actions taken by the facility to come into compliance with the regulations. Dico requested that DHS offer suggestions for compliance rather than a Report of Violation (ROV).
- 10/20/87 DHS issued an ROV citing 22 violations against Dico as a result of the September 29, 1987 inspection.
- 11/23/87 Dico responded to the ROV and indicated that efforts were being made by the facility to come into compliance. The deadline date for this compliance schedule was set for December 15, 1987.



## 2. Records Review

- 12/15/87 Dico submitted to the DHS copies of the personnel training plan, waste analysis plan, and closure plan.
- 6/10/88 The Financial Responsibility Unit (FRU) of the DHS evaluated Dico's financial assurance and liability documents and determined that Dico failed to demonstrate the financial responsibility required to manage hazardous waste.
- 5/9/89 A DHS representative obtained samples of oil from tanker trucks. These tanker loads were accompanied by manifests that were accepted by Dico. The samples were analyzed by the SCL and found to be hazardous. No specifics are given (the report is in the DTSC file).
- 6/20/89 The FRU sent a warning letter to Dico stating that they had not complied with conditions described in their ISD. FRU gave the facility a 10 day extension to submit the required financial responsibility documents or risk the revocation of the ISD.
- 9/13/89 The FRU again reviewed Dico's financial records and observed that Dico was still not in compliance with financial assurance and liability requirements.
- 9/18/89 The FRU issued an ROV against Dico based on observations from the record review made on September 13, 1989.
- 10/26/89 & 11/26/89 Dico was inspected by DHS. Potential violations included the following:
- no written closure estimate
  - no copy of closure plan was available for inspection
  - no copy of Biennial Report available
  - no contingency plan available
  - failure to place hazardous waste in labeled containers
  - falsely certifying "recycled oil" which did not meet standards.
- 11/9/89 The DHS issued a ROV against Dico based on the violations observed during the October 26, 1989 inspection.



## 2. Records Review

- 1/16/90 The FRU issued a Statement of Facts on Dico describing its financial compliance history for closure and liability coverage. According to the document, Dico was clearly out of compliance with financial responsibility requirements as of January 5, 1990 and had not shown good faith efforts to comply. The document recommended the assessment of penalties of \$27,500 for violating California Code of Regulations Title 22 Sections
- 2/6/90 The DHS issued a Corrective Action Order (CAO) against Dico for the following violations:
- soil contaminated with excessive levels of PCBs being disposed of at the west side of the driveway on site and also being added to the berm surrounding the tank farm area on site.
  - false certification of recycled oil contaminated with lead
  - failure to use a certified laboratory to perform analysis of recycled oil
  - failure to possess adequate financial assurance for closure
  - failure to provide adequate financial coverage for sudden accidental occurrences
  - failure to prepare and submit a copy of the biennial report to the DHS by March 1 of the years 1986 and 1988
  - failure to properly label 14 containers of waste oil drippings
  - failure to furnish or make available for inspection its closure plan
  - failure to immediately amend its contingency plan when the emergency coordinator for the facility left the employ of Dico
- 4/1/91 A Stipulation and Order was issued by the DHS to Dico based on the February 6, 1990, CAO. Dico was directed to pay \$1,041.67 per month for 2 years for a total penalty of \$25,000.



## 2. Records Review

- 5/7/91 DHS met with Richard Cowan, facility owner/operator. Mr. Cowan stated that he would be unable to implement the approved workplan for characterization of the vertical and horizontal extent of the PCB soil contamination until January
- 5/9/91 DHS visited Dico to check for compliance with the April 1, 1991 settlement agreement. All violations had been corrected, except for the pending removal of the contaminated soil.
- 12-16-91 DTSC conducted a inspection of Dico and  
& 1-7-91 observed the following potential violations:
- failure to maintain facility so as to minimize the possibility of an accident or sudden unplanned release of hazardous waste
  - failure to sign and date manifest
  - failure to properly secure a container holding hazardous waste
- 2/18/92 The DTSC issued a Field Order against Dico based on the above-mentioned inspection.



## 2. Records Review

- 9/30/93 The DTSC issued a ROV based on an inspection conducted on August 16, 1993. The following violations were included:
- storage of 55-gallon drums of hazardous oil and soil waste for more than 90 days
  - failure to obtain a hazardous waste storage facility permit or other grant of authorization from the DTSC
  - failure to provide secondary containment for tanks system
  - failure to submit a proposed alternative financial mechanism for closure costs together with a letter of proposed mechanism to be considered acceptable for meeting requirements of Title 22
  - failure to adjust closure cost estimate for inflation within 60 days prior to the August 2 anniversary date of established closure cost fund
  - failure to keep containers of hazardous waste closed except when adding or removing hazardous waste
  - failure to maintain and operate facility in a manner to minimize releases of hazardous waste and minimize possibility of fire or explosion
  - various oil leaks throughout the facility
  - failure to provide the DTSC with Tank Integrity Assessments certified by a registered professional engineer
  - failure to submit an annual report of the total volume of used oil possessed at the beginning and end of the preceding calendar year
  - failure to provide proper decontamination equipment and spill control
  - failure to keep a copy of the inspection schedule at the facility
  - failure to update Dico's contingency plan.
- 12/28/93 The DTSC issued an Enforcement Order to Dico for violations identified in the August 16, 1993 inspection.



## 2. Records Review

5/13/94 The DTSC issued a ROV as a result of an inspection conducted on April 7, 1994. Violations included the following:

- failure to document inspection logs for presence of leaks in AST 4
- failure to notify all facility personnel about leaks or releases resulting from AST 4
- failure to immediately remove AST 4 from service when releases were discovered
- failure to notify the DTSC within 24 hours of release
- negligently causing disposal of hazardous waste at an unauthorized point on the facility
- failure to perform routine inspection of ASTs/USTs from March 31, 1994 to April 7, 1994



# 3

## START Investigation

On May 2, 2003, the START conducted a drive-by inspection of the facility with FOSC Benson. The facility was fenced and the gate was open. The facility appeared to be unmanned and site access was unrestricted. There were several tank trucks parked around the facility; the trucks had "Abbott Used Oil Company" and "Pearce Tank Lines" labels on the sides, and they had "Flammable" Department of Transportation placards. The START observed three ASTs in the containment area, as well as a smaller, two-stage AST on the ground to the west of the truck pad. The tank farm was overgrown with weeds.

On June 6, 2003, the START and FOSC Benson visited the site again to reconcile the various site maps and data locations from previous investigations with the present conditions of the site. Once again, the front gate was open and no personnel were on-site. FOSC spoke with Mr. Gary Abbott, owner of Abbott Used Oil, who said that he and Pearce Trucking rented space at the facility for parking vehicles only. He stated that he has no involvement with the Dico property. In addition, he reported that he pays rent to a Mr. Herman Acevedo.

On June 16, 2003, FOSC Benson tasked the START to conduct a site reconnaissance of the facility for the purposes of determining potential sample locations and determining if the site met requirements for a Removal Action under CERCLA. The START met with FOSCs Benson and R. Wise at the site. Also present at the site were J. Jaros (USEPA Civil Investigator), L. Marmol (current site owner), and J. Madden (Smith Emery, consultant to the site owner). Mr. Marmol explained that he had just recently taken possession of the property, and he was trying to clean the site up for commercial gain. Mr. Marmol signed an agreement with the

### **3. START Investigation**

USEPA for site access and sampling of both Dico and the adjacent residences, which he owns as well.

The START walked through the site and found the tank farm had been disturbed since the last site map generated during the DTSC 1994 RCRA Facility Assessment Report (DTSC, 1994b). ASTs 2 and 3 were found in place with the piping attached. One AST, TB, had been moved from the south to the north end of the tank farm, where the waste pit removal had occurred; AST TB was attached to the piping manifold and oil was observed leaking from the joints. AST 5, the two-staged AST originally located in the northernmost part of the tank farm, was located outside the berm between the truck pad and the western fence. ASTs 1 and 4 appeared to have been removed from the tank farm, along with several cubic yards of soil and the southernmost wall of the tank farm berm.

Based on the site walk and information from the DTSC file review, FOSC Benson tasked the START to conduct a sampling event on the following day to determine the degree of PCB, TPH, metals, and possibly VOC contamination at the site. The START was tasked to collect up to 14 soil samples from locations that were likely impacted by past site use, using composites to cover areas such as the berm and the western fence margin. In addition, composite surface soil samples would be collected in the yards of the adjacent residences to assess off-site migration of chemicals.

The START generated a Quality Assurance Sampling Plan (QASP) for the sampling event (Appendix B). The QASP described collection of the following samples:

- One 4-point composite sample at each of the adjacent residences.
- Three 4-point composite samples from the containment berm surrounding the tank farm, which was known to be a repository for excavated soil.
- Two 4-point composite samples along the western fence line, which was known to be a repository for excavated soil and had documented PCB contamination.

### **3. START Investigation**

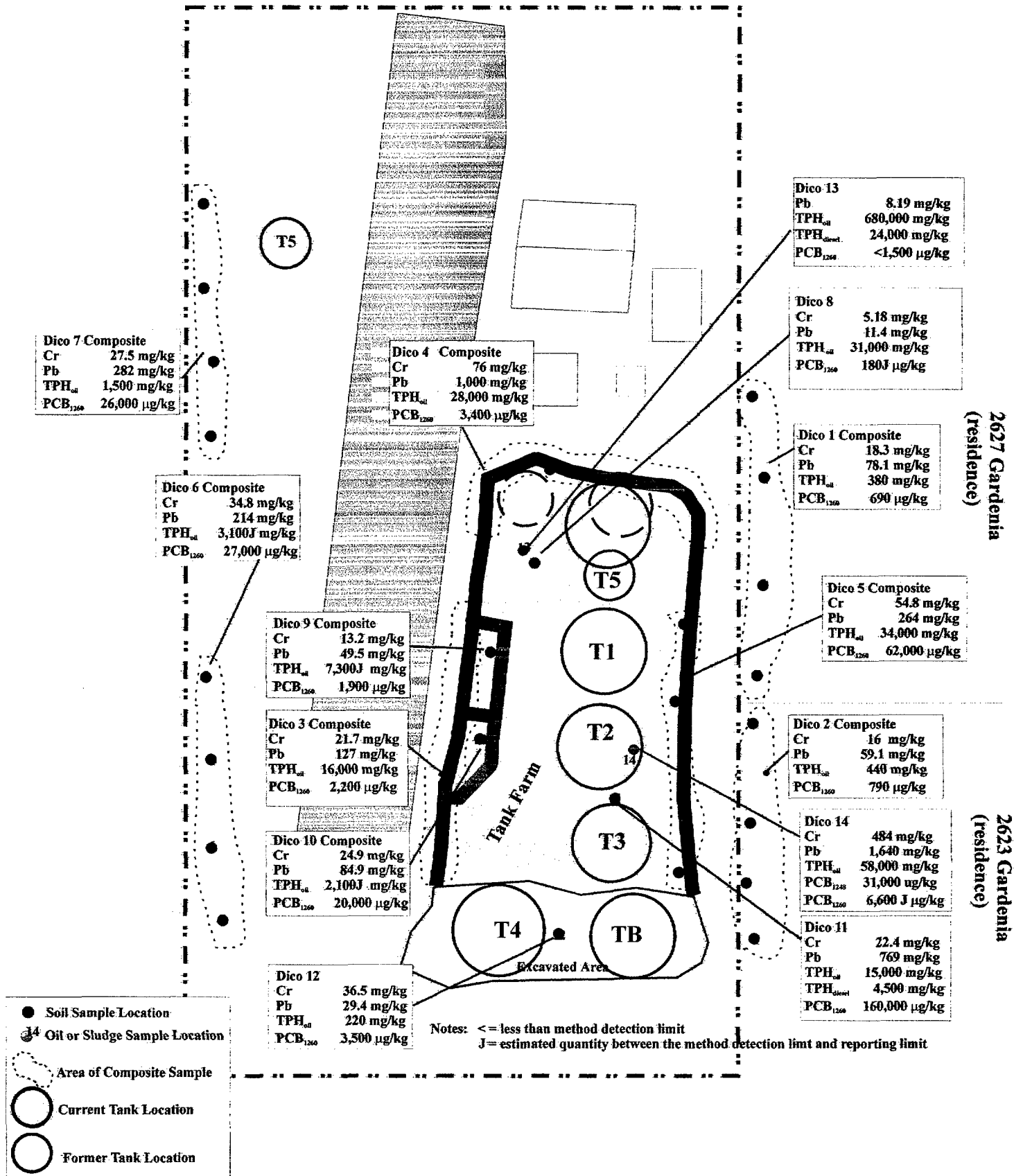
- Two samples from the tank farm trench area near the former locations of ASTs T3 and T4, where the DTSC identified PCB-contaminated soils.
- Five discretionary samples at the site, focused within berm area where visual or olfactory signs of leaking and/or suspected leak locations, such as pipe fittings and joints or areas near AST openings.

#### **3.1 Field Sampling**

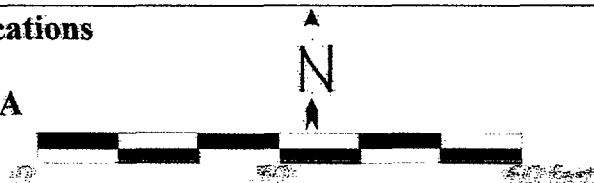
On June 20, 2003, the START arrived on site to implement the QASP. The START met with FOSC Benson and a representative of Emery Smith at the site. The field team conducted a health and safety meeting, then discussed the sampling event. The START identified the sampling locations using marking paint, then proceeded to collect samples. The START used a global positioning system (GPS) surveyor to map the site and sample locations; the sample locations are illustrated in Figure 4. A total of 14 soil samples and one duplicate sample for quality control purposes were collected from the site and adjacent residences. Photographic documentation of sampling activities is provided in Appendix C.

Samples were collected using dedicated trowels and placed into disposable plastic bags, homogenized, then distributed into sampling jars for shipment to a qualified START laboratory for TPH, metals, and PCBs analysis. In addition, sample locations were screened with a photo ionization detector (PID) to determine if VOC samples would be taken. No PID readings were recorded over background, therefore, no samples were submitted for VOC analysis.

The samples were documented on a chain-of-custody form and were in START possession at all times during the field investigation. Splits of the samples were hand-delivered under chain of custody to an Emery Smith representative on site. The START hand delivered the samples to Emax Laboratories in Torrance, California, for analysis.



**Figure 4: 2003 START Sample Locations  
Dico Removal Assessment  
1845 E. Willow, Signal Hill, CA**





### **3. START Investigation**

#### **3.2 Action Levels**

The following action levels, used for this investigation, were based on the high-occupancy nature of the site and the location of adjacent residences to the site.

- **TPH:** LARWQB Interim Site Assessment and Clean-up Levels were used; 1,000 mg/kg for TPH Diesel, and 10,000 mg/kg for TPH Oil.
- **PCBs:** The action level specified under 40 Code of Federal Regulations (CFR) Part 761.61 for high occupancy areas of 1 mg/kg ( or 1,000 µg/kg) was used.
- **Metals:** Region 9 USEPA Residential Preliminary Remediation Goals (PRGs) were used; the values for the specific metals of concern, lead and chromium, are 150 (Cal modified) and 210 mg/kg, respectively.

#### **3.3 Analytical Results**

E-max Laboratories analyzed each of the fourteen samples for TPH, PCBs, and metals. Laboratory data were validated by a START chemist in accordance with "EPA Quality Assurance/Quality Control Guidance for Removal Activities," OSWER Directive 9360.4-01 for definitive data use objectives and are considered to be usable for the intended purpose. Sample results are presented in Figure 4 and in Table 1. Appendix D contains the data validation reports, which include analytical data sheets. Raw laboratory data is maintained in the START project file.

### 3. START Investigation

**Table 1: Summary of START Analytical Results**

Chemical Analysis	PCBs *	TPH motor oil	TPH diesel	Chromium	Lead
Analytical Method	8082	8015-Modified	8015-Modified	6010B	6010B
Units	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Action Level	1,000	10,000	1,000	210	150
Sample ID (collected 6/20/2003)					
<b>Residential Sample Locations</b>					
Dico #1 - 2627 Gardenia	690	380	< 11	18.3	78.1
Dico #2 - 2623 Gardenia	790	440	< 57	16	59.1
<b>Containment Berm and Western Fence Line Sample Locations</b>					
Dico #3 - west berm	<b>2,200</b>	<b>16,000</b>	< 170	21.7	127
Dico #4 - north berm	<b>3,400</b>	<b>28,000</b>	< 1,000	76	<b>1,000</b>
Dico #5 - east berm	<b>62,000</b>	<b>34,000</b>	< 1,000	54.8	<b>264</b>
Dico #6 - west fence, south end	<b>27,000</b>	3,100 J	< 31	34.8	<b>214</b>
Dico #7 - west fence, north end	<b>26,000</b>	1,500	< 10	27.5	<b>282</b>
<b>Former Tank Farm Sample Locations</b>					
Dico #8 - grab, stained soil under piping	180J	<b>31,000</b>	< 1,000	5.18	11.4
Dico #9 - trench on west side of tank farm *	<b>1,900</b>	7,300 J	< 52	13.2	49.5
Dico #10 - triangular trench	<b>20,000</b>	2,100 J	< 12	24.9	84.9
Dico #11 - grab, base of AST 3, north side	<b>160,000</b>	<b>15,000</b>	<b>4,500</b>	22.4	<b>769</b>
Dico #12 - grab, approx AST 4 location	<b>3,500</b>	220	< 11	36.5	29.4
<b>Sludge Samples</b>					
Dico #13 - grab, sludge from pipeline attached to AST B	< 1,500 (total)	<b>680,000</b>	<b>24,000</b>	<2	8.19
Dico #14 - grab, sludge from AST 2	<b>6,600J</b> <b>31,000</b> <b>(Aroclor 1248)</b>	<b>58,000</b> —	< 14,000 —	<b>484</b> —	<b>1,640</b> —

Notes:

J = Estimated quantity

All samples are 4-part composites unless otherwise noted.

\* = 2 part composite sample

Values in **BOLD** exceed site action levels

\* PCBs are reported as the value for Aroclor 1260 unless otherwise noted

< reporting limit = not detected above the reporting limit

### **3. START Investigation**

#### **Soil Samples from Residential Locations**

Both residential composite samples (Dico #1 and 2) were below the site action levels for PCBs as aroclor mixtures, TPH as diesel and motor oil, and metals.

#### **Soil Samples from Containment Berm and Western Fence Line**

Five composite samples (Dico #3, 4, 5, 6, and 7) were collected from the containment berm surrounding the tank farm and the area along the western fence line, where previously excavated soils were placed.

PCB concentrations ranged from 2,200 to 62,000 µg/kg. All five samples collected from the tank farm containment berm and western fence line had PCB concentrations above the action level of 1,000 µg/kg. Concentrations of TPH as motor oil ranged from 1,500 to 34,000 mg/kg. Three of the five samples had TPH as motor oil concentrations above the action level of 10,000 mg/kg. Lead concentrations ranged from 127 to 1,000 mg/kg, and lead exceeded the action level (150 mg/kg) in four of the five samples. Chromium concentrations ranged from 21.7 to 76 mg/kg, but did not exceed the action level in any sample collected by START. Based on the analytical results, the containment berm and the western fence line soils exceed one or more action levels for the site and may require further investigation and removal.

#### **Soil Samples from within the Former Tank Farm**

Five samples were collected from stained areas inside the containment berm (Dico #8, 9, 10, 11, and 12).

PCB concentrations ranged from 180 to 160,000 µg/kg and exceeded the action level in four of the five samples collected. TPH motor oil concentrations ranged from 220 to 31,000 µg/kg and exceeded the action level in two of the five samples. Lead concentrations ranged from 11.4 to 769 mg/kg, and lead exceeded the action level in one of the five samples collected from within the former tank farm. Chromium concentrations ranged from 5.1 to 36.5 mg/kg, but did not exceed the action level for any samples collected. Based on the analytical results, the soils inside the former tank farm may require further investigation and removal.

#### **Sludge Samples**

Sludge samples were collected from AST B piping (Dico 13) and from inside AST 2 (Dico 14). The piping sample contained approximately 6.8 percent motor oil. The sample collected from



### **3. *START Investigation***

AST 2 had PCB, TPH motor oil, chromium, and lead concentrations above the site action levels. Waste product remaining in AST B piping and AST 2 should be properly disposed of off-site.



# 4

## Conclusions

The site has been operated as an oil recycling facility since approximately 1952. Dico operated a process storage and petroleum dehydration facility at the site between 1960 and 1995. Crude oil, diesel fuels, waste oils, and light to heavy fuel oils contaminated with water and solids were accepted from various sources. Primarily, the oil was recycled and sold on the bunker oil market as ship fuel.

The site has approximately 11 years (1986 through 1995) of recorded violation history with the DTSC. The environmental violations filed during these years were for suspected releases of chemicals to the soil and the improper management of hazardous waste. The DTSC confirmed PCB and TPH contamination in site soils by analysis of samples in the 1990s.

At present, the site has unrestricted access, and two residential properties, deeded to the new site owner, are located adjacent to the site.

The START collected soil and sludge samples throughout the site to assess the current state of site contamination. Based on analytical results obtained during this sampling event, soils in the containment berm, in the tank farm, and along the western fence line exceed action levels for PCBs, TPH as motor oil, and lead. The sludge samples collected from the piping and AST bottom measured PCB, TPH as motor oil, lead, and chromium above the action levels. A fence line composite sample collected from each of the adjoining residences did not indicate chemicals of concern above the site action levels.

The TPH and metals analytical results compare favorably with the 1989 (E & E, 1990) results from the trench excavation (44,000 mg/kg TPH, 340 lead and 37 chromium) and the 1989 DHS Hazard Appraisal results for PCBs (1,400 to 180,000 µg/kg).



#### **4. Conclusions**

##### **USEPA Action Memorandum Proposed Actions**

Based on current and historical analytical data collected for site soils, the proximity of the site to residential receptors, and the unrestricted access to the site, the USEPA Action Memorandum recommended the following actions be completed at the site (USEPA, 2003):

- Tank farm decommissioning (remove ASTs, piping, etc...)
- Vertical and horizontal characterization of the extent of PCB, TPH as motor oil, and lead contaminated soil
- Excavation and removal of contaminated soil
- Clean-up verification and restoration

In addition to recommending the removal action, the USEPA Action Memorandum indicated that applicable or relevant and appropriate requirements (ARARs) for the site should include:

- Toxic Substance Control Act PCB Rule, 40 CFR Part 761
- RCRA Land Disposal Restrictions, 40 CFR Part 268.40, Subpart D
- CERCLA Off-Site Disposal Rule Office of Solid Waste and Emergency Response Directive 9347.3-8 FS
- U.S. Department of Transportation Hazardous Materials Regulations, 49 CFR Part 171, 172, and 173.
- California Health and Safety Code, Characteristics of Hazardous Waste, Title 22, 66261.20, 66261.21, 66261.22, 66261.23, and 66261.24.

# 5

## References

Ball, 1988. Geotechnical Report, Subsurface Tank Site at 2623 Gardenia Avenue, Signal Hill. Alexander R. Ball, Canoga Park, California, June 22, 1988.

California Department of Health Services (DHS), 1989. Hazard Appraisal and Recognition Plan Daily Site Visit Document, Dico Oil Company; State of California, Department of Health Services, 1989.

California Environmental Protection Agency Department of Toxic Substance Control (DTSC), 1993. Inspection Report: Dico Oil Company; State of California, Department of Toxic Substance Control, September 24, 1993.

Dico Oil Company (Dico), 1986. Facility Operations Plan.

DTSC, 1994a. RCRA Visual Site Inspection and Facility Sampling Plan; State of California Environmental Protection Agency, Department of Toxic Substance Control, 1994.

DTSC, 1994b. RCRA Facility Assessment Report; State of California Environmental Protection Agency, Department of Toxic Substance Control, June 1994.

Ecology & Environment, Inc. (E & E), 1988. Reassessment of the Dico Oil company; Ecology & Environment, Inc. Los Angeles, California, September 22, 1988.

E & E, 1990. CERCLA Screening Site Inspection: Dico Oil Company; Ecology & Environment, Inc., San Francisco, California, March 16, 1990.



## **5. References**

Geological Research, 1994. Environmental Site Assessment and Soil Analyses Report, Geological Research, Newport Beach, CA, September 30, 1994.

United States Environmental Protection Agency (USEPA), 2003. Action Memorandum, Request for a Time-Critical Removal Action at the Dico Waste Oil Site, 1845 E. Willow St., Signal Hill, Los Angeles County, California, September 2003.

United States Geological Service (USGS), 1981. Long Beach Quadrangle Map.

## Appendix A

### Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St., Signal Hill, CA

Ball, 1988. Geotechnical Report, Subsurface Tank Site at 2623 Gardenia Avenue, Signal Hill						
Sample	Method	Analyte	Result	Units	Depth	Location
1-14.5'	418.1	TPH	22.5	mg/kg	14.5	trench excavation, south wall east side
2-12.5'	418.1	TPH	27.1	mg/kg	12.5	trench excavation, east wall
3-10.0'	418.1	TPH	945.3	mg/kg	10	trench excavation, west wall
4-15.5'	418.1	TPH	19.7	mg/kg	15.5	trench excavation, south wall west side
Bryant and Associates, 1989 (quoted by E&E, 1990)						
Sample	Method	Analyte	Result	Units	Location	
unknown	418.1	TPH	44000	mg/kg	surface soil from trench excavation	
unknown	VOCs	VOCs	nd	NA	surface soil from trench excavation	
unknown	metals	Chromium	37	mg/kg	surface soil from trench excavation	
unknown	metals	lead	340	mg/kg	surface soil from trench excavation	
DHS, 1989. Hazard Appraisal and Recognition Plan Daily Site Visit Document, Dico Oil Company						
Sample	Method	Analyte	Result	Units	Location	
1	8080	Aroclor 1260	1.4	mg/kg	Soil from trench excavation, fence line	
2	8080	Aroclor 1260	160	mg/kg	Soil from trench excavation, fence line	
3	8080	Aroclor 1260	180	mg/kg	Soil from trench excavation, fence line	
DTSC 1994a. RCRA Visual Site Inspection and Facility Sampling Plan						
Sample	Method	Analyte	Result	Units	Location	
unknown	8080	Aroclor 1260	4400	mg/kg*	Soil from trench in berm area	
unknown	8080	Aroclor 1260	3600	mg/kg*	Soil from trench in berm area	

**Notes:**

- \* units may have been reported in error. Original laboratory report is not available. Units may be µg/kg.
- nd chemical not detected
- NA not applicable
- mg/kg milligrams per kilogram

## Appendix A

### Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St., Signal Hill, CA

DTSC 1994b. RCRA Facility Assessment Report - Surface Soil Sample Results					
Sample	Method	Analyte	Result	Units	Location
YMDO-4	TPH	TPH	17000	mg/kg	Base of T4
YMDO-4	metals	metals	nd	mg/kg	Base of T4
<b>YMDO-5</b>					
YMDO-5	VOCs	toluene	160	µg/kg	Between T2 and T3
YMDO-5	VOCs	benzene	8.7	µg/kg	Between T2 and T3
YMDO-5	VOCs	methylene chloride	11	µg/kg	Between T2 and T3
YMDO-5	VOCs	tetrachloroethene	15	µg/kg	Between T2 and T3
YMDO-5	VOCs	ethylbenzene	27	µg/kg	Between T2 and T3
YMDO-5	VOCs	m&p xylenes	99	µg/kg	Between T2 and T3
YMDO-5	VOCs	o xylene	43	µg/kg	Between T2 and T3
YMDO-5	VOCs	1,3,5 trimethylbenzene	15	µg/kg	Between T2 and T3
YMDO-5	VOCs	1,2,4 trimethylbenzene	38	µg/kg	Between T2 and T3
YMDO-5	VOCs	1,2,4 Trichlorobenzene	114	µg/kg	Between T2 and T3
YMDO-5	SVOCs	SVOCs	nd	mg/kg	Between T2 and T3
YMDO-5	PCBs	Aroclor 1260	360	mg/kg	Between T2 and T3
YMDO-5	TPH	TPH	4300	mg/kg	Between T2 and T3
YMDO-5	metals	metals	nd	mg/kg	Between T2 and T3
<b>YMDO-6</b>					
YMDO-6	VOCs	m&p xylenes	1.2	µg/kg	Within 5 feet of the base of TA5
YMDO-6	VOCs	1,2,4 trimethylbenzene	2.2	µg/kg	Within 5 feet of the base of TA5
YMDO-6	SVOCs	pyrene	5.4	mg/kg	Within 5 feet of the base of TA5
YMDO-6	SVOCs	chrysene	6.3	mg/kg	Within 5 feet of the base of TA5
YMDO-6	PCBs	Aroclor 1260	24	mg/kg	Within 5 feet of the base of TA5
YMDO-6	TPH	TPH	29000	mg/kg	Within 5 feet of the base of TA5
YMDO-6	metals	metals	nd	mg/kg	Within 5 feet of the base of TA5
<b>YMDO-7</b>					
YMDO-7	VOCs	toluene	2.4	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	tetrachloroethene	2	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	m&p xylenes	5.7	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	o xylene	5.2	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	1,3,5 trimethylbenzene	4.2	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	1,2,4 trimethylbenzene	6.6	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	VOCs	Naphthalene	2	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	SVOCs	Naphthalene	2	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	SVOCs	methyl naphthalene	6.1	µg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	PCBs	Aroclor 1260	nd	mg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	TPH	TPH	23000	mg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
YMDO-7	metals	metals	nd	mg/kg	Within area of former steel-lined pit/ 10,500 gal USTs
<b>YMDO-8</b>					
YMDO-8	VOCs	toluene	22	µg/kg	Northwest side of T5

**Appendix A**  
**Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St.,  
Signal Hill, CA**

Geological Research, 1994. Environmental Site Assessment and Soil Analyses Report						
Sample	Method	Analyte	Result	Units	Depth (feet)	Location
<b>HA-1, 3 feet bgs</b>						
HA-1	8240	acetone	nd	µg/kg	3	Soil boring in berm area
HA-1	8240	benzene	33	µg/kg	3	Soil boring in berm area
HA-1	8240	2-butanone	nd	µg/kg	3	Soil boring in berm area
HA-1	8240	ethylbenzene	nd	µg/kg	3	Soil boring in berm area
HA-1	8240	tetrachloroethene	nd	µg/kg	3	Soil boring in berm area
HA-1	8240	1,1,1 trichloroethane	nd	µg/kg	3	Soil boring in berm area
HA-1	8240	xylenes	7500	µg/kg	3	Soil boring in berm area
HA-1	8080	Aroclor 1260	nd	µg/kg	3	Soil boring in berm area
HA-1	8015-M	TPH	nd	mg/kg	3	Soil boring in berm area
HA-1	6010	chromium	nd	mg/kg	3	Soil boring in berm area
HA-1	6010	lead	nd	mg/kg	3	Soil boring in berm area
<b>HA-1, 6 feet bgs</b>						
HA-1	8240	acetone	nd	µg/kg	6	Soil boring in berm area
HA-1	8240	benzene	nd	µg/kg	6	Soil boring in berm area
HA-1	8240	ethylbenzene	nd	µg/kg	6	Soil boring in berm area
HA-1	8240	tetrachloroethene	nd	µg/kg	6	Soil boring in berm area
HA-1	8240	1,1,1 trichloroethane	nd	µg/kg	6	Soil boring in berm area
HA-1	8240	toluene	11	µg/kg	6	Soil boring in berm area
HA-1	8240	xylenes	33	µg/kg	6	Soil boring in berm area
HA-1	8080	Aroclor 1260	51	µg/kg	6	Soil boring in berm area
HA-1	6010	chromium	nd	mg/kg	6	Soil boring in berm area
HA-1	6010	lead	5.7	mg/kg	6	Soil boring in berm area
<b>HA-1, 9 feet bgs</b>						
HA-1	8240	acetone	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	benzene	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	2-butanone	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	ethylbenzene	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	tetrachloroethene	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	1,1,1 trichloroethane	nd	µg/kg	9	Soil boring in berm area
HA-1	8240	toluene	24	µg/kg	9	Soil boring in berm area
HA-1	8240	xylenes	100	µg/kg	9	Soil boring in berm area
HA-1	8080	Aroclor 1260	66	µg/kg	9	Soil boring in berm area
HA-1	8015-M	TPH	nd	mg/kg	9	Soil boring in berm area
HA-1	6010	chromium	nd	mg/kg	9	Soil boring in berm area
HA-1	6010	lead	nd	mg/kg	9	Soil boring in berm area
<b>HA-2, 3 feet bgs</b>						
HA-2	8240	acetone	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	benzene	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	2-butanone	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	ethylbenzene	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	tetrachloroethene	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	1,1,1 trichloroethane	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	toluene	nd	µg/kg	3	Soil boring in berm area
HA-2	8240	xylenes	nd	µg/kg	3	Soil boring in berm area

**Appendix A**  
**Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St.,**  
**Signal Hill, CA**

<b>Geological Research, 1994. Environmental Site Assessment and Soil Analyses Report</b>						
<b>Sample</b>	<b>Method</b>	<b>Analyte</b>	<b>Result</b>	<b>Units</b>	<b>Depth (feet)</b>	<b>Location</b>
HA-3	8240	benzene	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	2-butanone	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	ethylbenzene	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	tetrachloroethene	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	1,1,1 trichloroethane	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	toluene	nd	µg/kg	6	Soil boring in berm area
HA-3	8240	xylene	nd	µg/kg	6	Soil boring in berm area
HA-3	8080	Aroclor 1260	nd	µg/kg	6	Soil boring in berm area
HA-3	8015-M	TPH	nd	mg/kg	6	Soil boring in berm area
HA-3	6010	chromium	nd	mg/kg	6	Soil boring in berm area
HA-3	6010	lead	nd	mg/kg	6	Soil boring in berm area
<b>HA-3, 9 feet bgs</b>						
HA-3	8240	acetone	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	benzene	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	2-butanone	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	ethylbenzene	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	tetrachloroethene	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	1,1,1 trichloroethane	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	toluene	nd	µg/kg	9	Soil boring in berm area
HA-3	8240	xylene	nd	µg/kg	9	Soil boring in berm area
HA-3	8080	Aroclor 1260	nd	µg/kg	9	Soil boring in berm area
HA-3	8015-M	TPH	nd	mg/kg	9	Soil boring in berm area
HA-3	6010	chromium	nd	mg/kg	9	Soil boring in berm area
HA-3	6010	lead	nd	mg/kg	9	Soil boring in berm area
<b>HA-4, 3 feet bgs</b>						
HA-4	8240	acetone	98	µg/kg	3	Soil boring in berm area
HA-4	8240	benzene	nd	µg/kg	3	Soil boring in berm area
HA-4	8240	2-butanone	51	µg/kg	3	Soil boring in berm area
HA-4	8240	ethylbenzene	570	µg/kg	3	Soil boring in berm area
HA-4	8240	tetrachloroethene	110	µg/kg	3	Soil boring in berm area
HA-4	8240	1,1,1 trichloroethane	52	µg/kg	3	Soil boring in berm area
HA-4	8240	toluene	1400	µg/kg	3	Soil boring in berm area
HA-4	8240	xylene	2900	µg/kg	3	Soil boring in berm area
HA-4	8080	Aroclor 1260	nd	µg/kg	3	Soil boring in berm area
HA-4	8015-M	TPH	1100	mg/kg	3	Soil boring in berm area
HA-4	6010	chromium	nd	mg/kg	3	Soil boring in berm area
HA-4	6010	lead	nd	mg/kg	3	Soil boring in berm area
<b>HA-4, 6 feet bgs</b>						
HA-4	8240	acetone	nd	µg/kg	6	Soil boring in berm area
HA-4	8240	benzene	nd	µg/kg	6	Soil boring in berm area
HA-4	8240	2-butanone	nd	µg/kg	6	Soil boring in berm area
HA-4	8240	ethylbenzene	33	µg/kg	6	Soil boring in berm area
HA-4	8240	tetrachloroethene	8	µg/kg	6	Soil boring in berm area
HA-4	8240	1,1,1 trichloroethane	nd	µg/kg	6	Soil boring in berm area
HA-4	8240	toluene	69	µg/kg	6	Soil boring in berm area



**Appendix A**  
**Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St.,  
Signal Hill, CA**

<b>Geological Research, 1994. Environmental Site Assessment and Soil Analyses Report</b>						
<b>Sample</b>	<b>Method</b>	<b>Analyte</b>	<b>Result</b>	<b>Units</b>	<b>Depth (feet)</b>	<b>Location</b>
HA-5	8240	acetone	98	µg/kg	9	Soil boring in berm area
HA-5	8240	benzene	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	2-butanone	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	ethylbenzene	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	tetrachloroethene	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	1,1,1 trichloroethane	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	toluene	nd	µg/kg	9	Soil boring in berm area
HA-5	8240	xylenes	nd	µg/kg	9	Soil boring in berm area
HA-5	8080	Aroclor 1260	nd	µg/kg	9	Soil boring in berm area
HA-5	8015-M	TPH	790	mg/kg	9	Soil boring in berm area
HA-5	6010	chromium	5.2	mg/kg	9	Soil boring in berm area
HA-5	6010	lead	nd	mg/kg	9	Soil boring in berm area
<b>HA-6, 3 feet bgs</b>						
HA-6	8240	acetone	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	benzene	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	2-butanone	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	ethylbenzene	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	tetrachloroethene	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	1,1,1 trichloroethane	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	toluene	nd	µg/kg	3	Soil boring in berm area
HA-6	8240	xylenes	nd	µg/kg	3	Soil boring in berm area
HA-6	8080	Aroclor 1260	nd	mg/kg	3	Soil boring in berm area
HA-6	8015-M	TPH	nd	mg/kg	3	Soil boring in berm area
HA-6	6010	chromium	nd	mg/kg	3	Soil boring in berm area
HA-6	6010	lead	nd	mg/kg	3	Soil boring in berm area
<b>HA-6, 6 feet bgs</b>						
HA-6	8240	acetone	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	benzene	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	2-butanone	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	ethylbenzene	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	tetrachloroethene	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	1,1,1 trichloroethane	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	toluene	nd	µg/kg	6	Soil boring in berm area
HA-6	8240	xylenes	nd	µg/kg	6	Soil boring in berm area
HA-6	8080	Aroclor 1260	nd	mg/kg	6	Soil boring in berm area
HA-6	8015-M	TPH	nd	mg/kg	6	Soil boring in berm area
HA-6	6010	chromium	nd	mg/kg	6	Soil boring in berm area
HA-6	6010	lead	nd	mg/kg	6	Soil boring in berm area
<b>HA-6, 9 feet bgs</b>						
HA-6	8240	acetone	nd	µg/kg	9	Soil boring in berm area
HA-6	8240	benzene	nd	µg/kg	9	Soil boring in berm area
HA-6	8240	2-butanone	nd	µg/kg	9	Soil boring in berm area
HA-6	8240	ethylbenzene	nd	µg/kg	9	Soil boring in berm area
HA-6	8240	tetrachloroethene	nd	µg/kg	9	Soil boring in berm area
HA-6	8240	1,1,1 trichloroethane	nd	µg/kg	9	Soil boring in berm area

## Appendix A

### Table 1 - Historical Soil Data for the Dico Oil Company Site, 1845 E. Willow St., Signal Hill, CA

Geological Research, 1994. Environmental Site Assessment and Soil Analyses Report						
Sample	Method	Analyte	Result	Units	Depth (feet)	Location
<b>HA-8, 3 feet bgs</b>						
HA-8	8240	acetone	nd	µg/kg	3	Soil boring in berm area
HA-8	8240	benzene	nd	µg/kg	3	Soil boring in berm area
HA-8	8240	2-butanone	nd	µg/kg	3	Soil boring in berm area
HA-8	8240	ethylbenzene	nd	µg/kg	3	Soil boring in berm area
HA-8	8240	tetrachloroethene	190	µg/kg	3	Soil boring in berm area
HA-8	8240	1,1,1 trichloroethane	nd	µg/kg	3	Soil boring in berm area
HA-8	8240	toluene	230	µg/kg	3	Soil boring in berm area
HA-8	8240	xlenes	1100	µg/kg	3	Soil boring in berm area
HA-8	8080	Aroclor 1260	4500	µg/kg	3	Soil boring in berm area
HA-8	8015-M	TPH	nd	mg/kg	3	Soil boring in berm area
HA-8	6010	chromium	nd	mg/kg	3	Soil boring in berm area
HA-8	6010	lead	nd	mg/kg	3	Soil boring in berm area
<b>HA-8, 6 feet bgs</b>						
HA-8	8240	acetone	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	benzene	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	2-butanone	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	ethylbenzene	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	tetrachloroethene	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	1,1,1 trichloroethane	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	toluene	nd	µg/kg	6	Soil boring in berm area
HA-8	8240	xlenes	150	µg/kg	6	Soil boring in berm area
HA-8	8080	Aroclor 1260	410	µg/kg	6	Soil boring in berm area
HA-8	8015-M	TPH	1800	mg/kg	6	Soil boring in berm area
HA-8	6010	chromium	nd	mg/kg	6	Soil boring in berm area
HA-8	6010	lead	nd	mg/kg	6	Soil boring in berm area
<b>HA-8, 9 feet bgs</b>						
HA-8	8240	acetone	95	µg/kg	9	Soil boring in berm area
HA-8	8240	benzene	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	2-butanone	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	ethylbenzene	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	tetrachloroethene	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	1,1,1 trichloroethane	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	toluene	nd	µg/kg	9	Soil boring in berm area
HA-8	8240	xlenes	67	µg/kg	9	Soil boring in berm area
HA-8	8080	Aroclor 1260	2600	µg/kg	9	Soil boring in berm area
HA-8	8015-M	TPH	nd	mg/kg	9	Soil boring in berm area
HA-8	6010	chromium	nd	mg/kg	9	Soil boring in berm area
HA-8	6010	lead	nd	mg/kg	9	Soil boring in berm area

**Notes:**

bgs      below ground surface  
 nd        chemical not detected  
 µg/kg    micrograms per kilogram  
 mg/kg    milligrams per kilogram

**B**

## **Quality Assurance Sampling Plan**

**Emergency Response Office  
and Superfund Technical Assistant  
and Response Team (START)**

*DICO Signal HTU*  
**Emergency Response  
Quality Assurance Sampling Plan  
for  
Soil, Debris and Water Sampling**

Response Location: *Dico Oil*

Date: *6/19/03*

Prepared By: *B. Castellons*

Reviewed By: *C. Melch 6/19/03.*

Approved By (FOSC or Incident Commander):

*Chris [Signature] 6/20/03*  
*0346.01.R5*

This sampling plan form has been designed to assist field responders in their preparation for collecting, analyzing, shipping, storing and in all other ways handling samples collected in the field. The use of this generic sampling plan form will involve forethought and planning that should help direct the sampling and analytical work. It is meant to be used in the case of emergency responses or time-critical responses when sampling teams may not have the opportunity to write a more thorough sampling plan. Sampling teams should always reference their own agencies' standard quality procedures and SOPs for field guidance and analytical procedures.

The development of this generic plan will improve the documentation, communication, planning, and overall quality associated with the sampling and analysis by:

- 1) encouraging field teams to consider their goals and objectives before gathering their samples,
- 2) creating a common written plan for multiple field sampling teams from differing agencies or with differing sampling tasks,
- 3) increasing communication between clean-up contractors and jurisdictional agencies, and
- 4) detailing expectations before samples are collected.

## 2.0 Objectives

Objectives are summarized in Table A.

### 2.1 Data Use Objectives. (How will the air data be used?)

#### Check Appropriate Box(es):

Air data that are generated will be used:

- 1 ☒ To be compared with federal or state occupational health limits (On-Site Health and Safety Assessment data).
- 2 ☐ To assist in Off-Site Acute Exposure Assessment.
- 3 ☐ To assist with determining the area of impact due to a hazardous material release.
- 4 ☐ To assist in the identification of the potential source of contaminant.
- 5 ☒ To be compared with or other risk-based action levels (e.g. EPA Preliminary Remedial Goals) to determine if chronic health threats exist.
- 6 ☐ As definitive confirmatory data for non-definitive (screening) data.
- 7 ☐ To be compared to a background level or sample(s).
- 8 ☐ Other objectives: \_\_\_\_\_

### 2.2 Sampling Objectives. (What are you proposing to do?)

- 1 ☒ Judgemental (Authoritative) Surface Soil Sampling for: PCBs, metals, TPH, VOCs.
- 2 ☐ Statistical Grid Surface Sampling for: \_\_\_\_\_
- 3 ☐ Judgemental (Authoritative) Subsurface Soil Sampling using: \_\_\_\_\_
- 4 ☐ Statistical Grid Subsurface Soil Sampling using: \_\_\_\_\_
- 5 ☐ Personal air monitoring of on-site personnel (For Personal Health and Safety).
- 6 ☐ Personal air sampling of on-site personnel (For Personal Health and Safety).
- 7 ☐ On-site air monitoring (real-time) to determine contamination levels (Not for personal Health and Safety).
- 8 ☐ On-site sampling to determine contamination levels (Not for personal Health and Safety).
- 9 ☐ Other objectives: \_\_\_\_\_

ERO/START:  
Soil Emergency QASP

<p align="center"><b>Table A</b> <b>Data Objectives and Sample Collection</b></p>				
<p align="center"><b>Sample Location</b> Refer to Section 3.3.1</p>	<p align="center"><b>Data Use Objective(s)</b> Refer to Section 2.1</p>	<p align="center"><b>Data Category</b> Refer to Section 2.3</p>	<p align="center"><b>Analytical Method</b> Refer to Section 3.1</p>	<p align="center"><b>Number of Samples</b></p>
Tank Farm	1, 5	36	ERI <del>END</del> (metals) PCB (8082) 8260 (VOLs) TPH (8015)	4-6 grab
Berm	1, 5	36	11 1	2-3 composites
Fence Line	1, 5	36	11	2-3 composites
Backyards	1, 5	36	11	2 composite

ERO/START:  
Soil Emergency QASP

☐ chlorine ☐ hydrocarbons ☐ nitric acid

☐ other: \_\_\_\_\_

**Sampling and Analysis Procedures:**

**EPA Methods:**

☐ Corrosivity (pH) ☒ Volatile Organic Compounds (8260) ☐ PAHs (HPLC)  
☐ Chromium, hexavalent ☐ Semi-Volatile Organic Compounds (8270) ☐ Dioxins  
☒ Metals (ICP) [6010/7471] ☐ Hydrogen cyanide ☐ TCLP \_\_\_\_\_  
☐ Asbestos & other fibers [7400] ☒ PCBs  
☐ other: TPH oil/diesel

**Other Sampling Procedures:**

*we will use a dedicated trowel to collect surface samples. Shallow subsurface samples may be collected using a hand reyer @ the client's request.*

Attach a local map to this plan if it is available.

[illegible]



### 3.5 Analytical Methods and Procedures

The analytical methods to be used are presented in Table A. General field QC considerations and requirements are presented in Table E.

<b>Table E</b> <b>Quality Control Samples and DQOs</b>			
<b>QC Sample</b>	<b>Number/Frequency</b>	<b>Evaluation Criteria</b>	<b>Comments/Exceptions</b>
<b>FIELD SPECIFIED QA/QC</b>			
Background or reference sample	At least one sample should be collected from an area believe to be unaffected by source contamination.	Source samples should be at least 3 times background.	Upwind.
Field Blanks	1 per SDG <sup>1</sup> , per matrix, per method	Source samples should be at least 3 times the blank.	
Sampling Media	1 per SDG, per matrix, per method	Source samples should be at least 3 times the blank.	As required by method.
Equipment blanks	1 per SDG, per matrix, per method	Source samples should be at least 3 times the blank.	Only when the use of decontaminated non-dedicated equipment is involved.
Field Duplicates	1 per SDG, per matrix, per method	50 to 200 RPD <sup>2</sup>	As needed by sampling objectives. The procedure for collecting duplicate samples can greatly effect the reproducibility.
<b>SELECTED LABORATORY QA/QC</b>			
Method Blank (MB)	1 per SDG, per matrix, per method.	Stds and samples should be at least 3 times the blank.	Mandatory.
Matrix Spike	1 per SDG, per matrix, per method on field designated sample.	75 -125 %R <sup>3</sup>	Designate sample on COC.
Matrix Spike Duplicate or Replicate	1 per SDG, per matrix, per method on field designated sample.	≤50 RPD for Organics; ≤20 RPD for metals.	Designate sample on COC.
Reference Standards	1 per SDG, per matrix, per method.	75 -125 %R	If available.
Internal Standards	All samples.	50 -200 %R	All GC/MS and some GC analyses only
Laboratory Control Standards	1 per SDG, per matrix, per method.	75 - 125 %R	Per method for organic analyses

ERO/START:  
Soil Emergency QASP

### 3.6 Project Laboratories

Laboratories used for this project are summarized in Table F.

Table F Laboratories	
Lab Name/ Location	Methods
<i>EMAX</i>	<i>SV methods</i>

### 4.0 Project Organization and Responsibilities

Project personnel and responsibilities are summarized in Table G.

Table G Sample Team(s) Personnel	
Personnel (Agency)	Responsibility
<i>B. Costelloe START</i>	<i>Project manager</i>
<i>E. Wilson START</i>	<i>Site H&amp;S, sampling</i>
<i>M. Seng START</i>	<i>Sample Traffic Control</i>
<i>C. Welch START</i>	<i>Sample support</i>
<i>C. Benson USEPA</i>	<i>Trick Monitor</i>

**C**

## **Photo Documentation**

## Appendix C: Dico Oil Company Photo Documentation

TDD No. 090305-0002

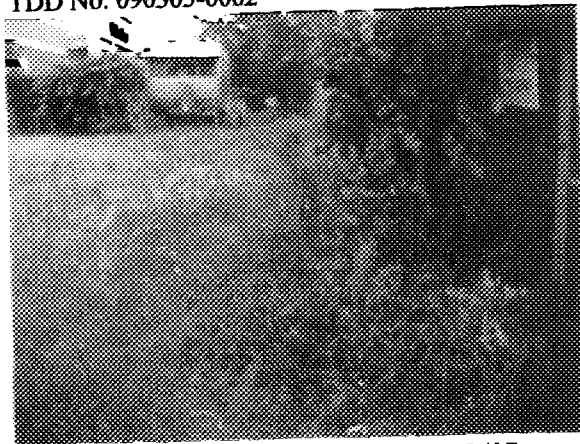


Photo 1: View of Dico sample location 1, 2627 Gardenia Avenue (residence) fence line.

Photographer: C. Welch Date: 6/20/03

Project No.0346.01RS



Photo 2: View of Dico sample location 2, 2623 Gardenia Avenue (residence) fence line.

Photographer: C. Welch Date: 6/20/03



Photo 3: View of Dico sample location 3, western side of tank farm berm.

Photographer: C. Welch Date: 6/20/03

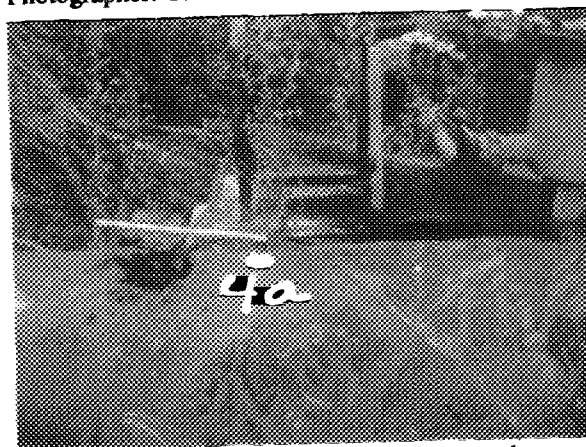


Photo 4: View of Dico sample location 4, north side of tank farm berm.

Photographer: C. Welch Date: 6/20/03



Photo 5: View of Dico sample location 5, eastern side of tank farm berm.

Photographer: C. Welch Date: 6/20/03



Photo 6: View of Dico sample location 6, southwestern fence line of site.

Photographer: C. Welch Date: 6/20/03

## Appendix C: Dico Oil Company Photo Documentation

TDD No. 090305-0002

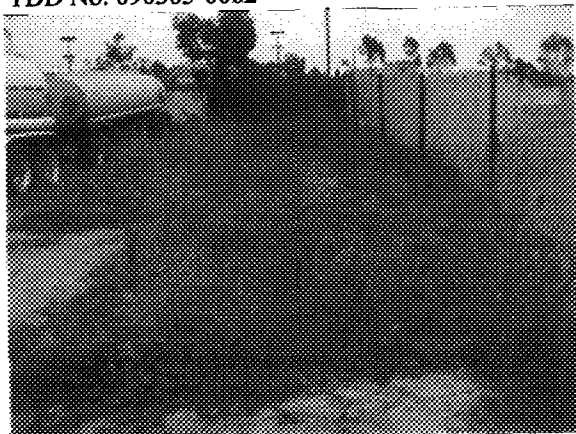


Photo 7: View of Dico sample location 7, northwestern fence line of site.

Photographer: C. Welch Date: 6/20/03

Project No.0346.01RS

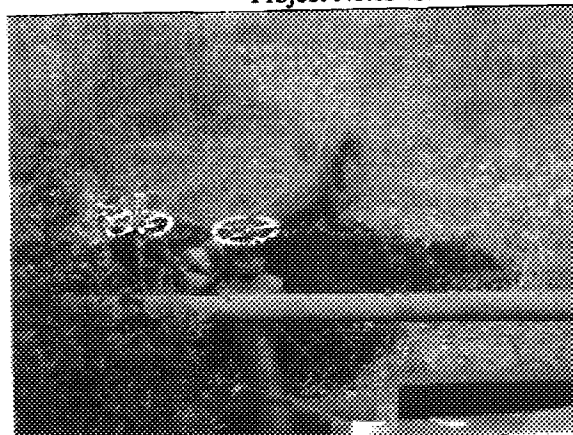


Photo 8: View of Dico sample location 8, stained soil under piping within on-site tank farm.

Photographer: C. Welch Date: 6/20/03

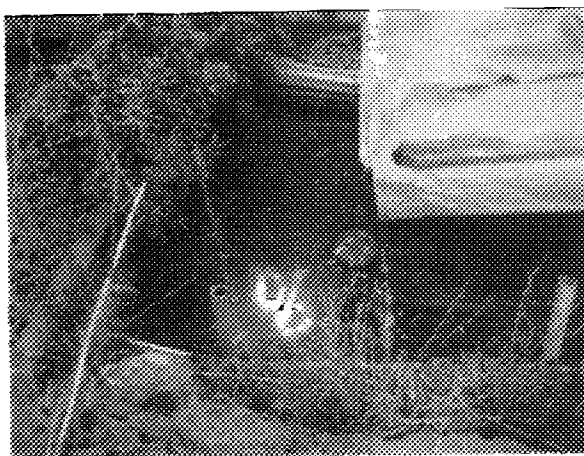


Photo 9: View of Dico sample location 9, rectangular trench on west side of on-site tank farm.

Photographer: C. Welch Date: 6/20/03



Photo 10: View of Dico sample location 10, triangular trench on west side of on-site tank farm.

Photographer: C. Welch Date: 6/20/03



Photo 11: View of Dico sample location 11, base of north side of AST 3.

Photographer: C. Welch Date: 6/20/03



Photo 12: View of Dico sample location 12, approximate location of former AST 4 with excavated area in southeastern portion of site.

Photographer: C. Welch Date: 6/20/03

## Appendix C: Dico Oil Company Photo Documentation

TDD No. 090305-0002

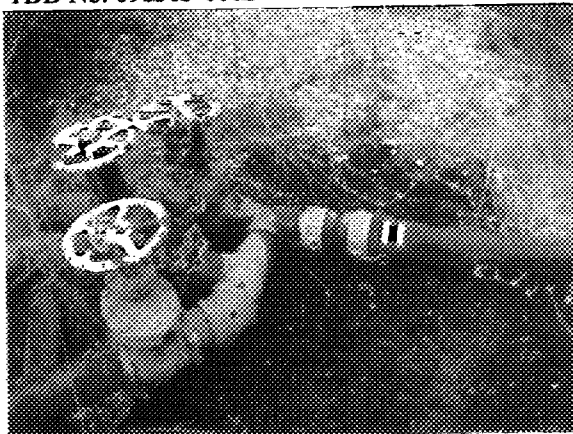


Photo 13: View of Dico sample location 13, sludge from pipeline attached to AST B.

Photographer: C. Welch Date: 6/20/03

Project No.0346.01RS

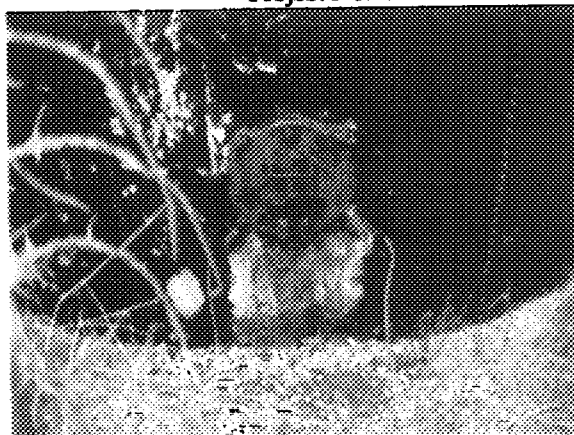


Photo 14: View of Dico sample location 14, sludge from AST 2.

Photographer: C. Welch Date: 6/20/03

**D**

## **Data Validation Reports**

## ANALYTICAL DATA REVIEW SUMMARY

<b>Site Name:</b> Dico Oil <b>Project TDD Number:</b> 09-03-05-0002	<b>Location:</b> Signal Hill, California <b>PAN:</b> 0346.01.RS
<b>Laboratory:</b> EMAX Laboratories, Inc. <b>Sampling Dates:</b> 06/20/03 <b>Analytical Method:</b> GC-PCB's only (8082)	<b>Lab Project Number:</b> 03F116 <b>Sample Matrix:</b> Soil <b>Data Reviewer:</b> Mindy Song

### REVIEW AND APPROVAL:

Data Reviewer: Mindy C. Song  
 Technical QA Reviewer: [Signature]  
 Project Manager: J. Woodruff

Date: 8/14/03  
 Date: 9-30-03  
 Date: 10/2/03

### SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	Dico 1 comp	03F116-01
2	Dico 2 comp	03F116-02
3	Dico 6 comp	03F116-03
4	Dico 7 comp	03F116-04
5	Dico 3 comp	03F116-05
6	Dico 4 comp	03F116-06
7	Dico 5 comp	03F116-07
8	Dico#8	03F116-08
9	Dico#9 comp	03F116-09
10	Dico#10 comp	03F116-10
11	Dico#12	03F116-11
12	Dico#11	03F116-12
13	Dico#15	03F116-13
14	Dico#13	03F116-14
15	Dico#14	03F116-15
16		
17		
18		
19		
20		



## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### DATA PACKAGE COMPLETENESS CHECKLIST:

#### Checklist Code:

<u>  X  </u>	Included: no problems
<u>  *  </u>	Included: problems noted in review
<u>  O  </u>	Not Included and/or Not Available
<u> NR </u>	Not Required
<u> RS </u>	Provided As Re-submission

#### Case Narrative:

<u>  X  </u>	Case Narrative present
--------------	------------------------

#### Quality Control Summary Package:

<u>  X  </u>	Data Summary sheets
<u>  *  </u>	Matrix Spike/Spike Duplicate Recoveries
<u>  X  </u>	Laboratory Control Sample Recoveries
<u>  X  </u>	Method Blank Summaries
<u>  X  </u>	Initial Calibration Data
<u>  X  </u>	Continuing Calibration Data
<u>  *  </u>	Surrogate Compound Recovery Summary
<u> NR </u>	DDT and Endrin Degradation Check Data
<u> NR </u>	Internal Standard Area Summary

#### Sample and Blank Data Package Section

<u>  X  </u>	Chromatograms
<u>  X  </u>	Quantitation Reports

#### Raw QC Data Package Section

<u>  X  </u>	Quantitation Reports for Standards, LCS, and MS/MSD
<u> NR </u>	List of Instrument Detection Limits
<u>  X  </u>	Chain-of-Custody Records
<u>  X  </u>	Sample Preparation and Analysis Run Logs

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil	Location: Signal Hill, California
Project TDD Number: 09-03-05-0002	PAN: 0346.01.RS

### DATA VALIDATION SUMMARY

The data were reviewed following procedures and limits specified in the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

Indicate with a YES or NO whether each item is acceptable:

1	Holding Times	<u>YES</u>
2	Instrument Performance Criteria	<u>YES</u>
3	Initial Calibrations	<u>YES</u>
4	Continuing Calibrations	<u>YES</u>
5	Laboratory Control Sample	<u>YES</u>
6	Matrix Spike/Matrix Spike Duplicate	<u>NO</u>
7	Blanks and Background Samples	<u>YES</u>
8	Surrogate Compounds	<u>NO</u>
9	Internal Standards	<u>NR</u>
10	Duplicate Analyses	<u>YES</u>
11	Analyte Identification	<u>YES</u>
12	Analyte Quantitation	<u>YES</u>
13	Overall Assessment of Data	<u>YES</u>
14	Usability of Data	<u>YES</u>

**Comments:** Fourteen soil samples and one sludge sample were submitted for PCBs by EPA 8082 on June 20, 2003. NA: Not Available NR: Not Required  
The laboratory quantified and reported the PCB results for both a primary and a secondary column. The laboratory also designated which quantification, for a given analyte, they determined to be the most accurate. In some instances, the data reviewer disagreed with the laboratory and chose to use the greater of the two results. In such a case, the decision was based on professional judgements through the review of chromatograms, peak area continuities, and the accuracy of a particular column with respect to continuing calibrations, laboratory control samples, and other QC.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

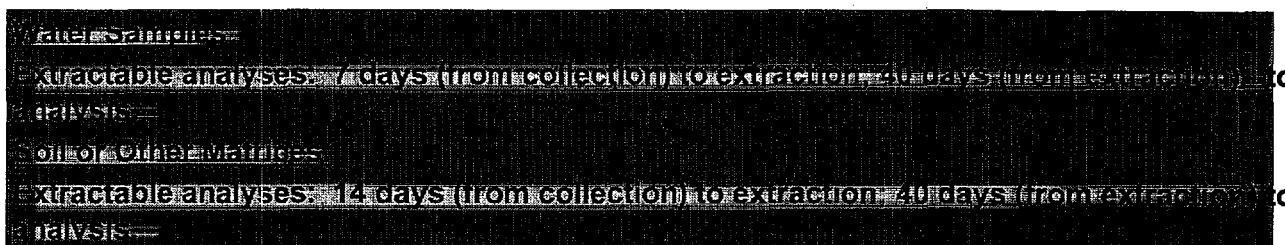
Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 1. HOLDING TIMES

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.



**Comments:** The samples were extracted 3 days from the time of collection and the extracts were analyzed 2 days from extraction. One sample was reanalyzed 10 days after extraction.

### 2. INSTRUMENT PERFORMANCE CRITERIA

- ☐ Raw data has been checked to verify that the DDT retention time is greater than 12 minutes and that there is adequate resolution (>25%) between peaks of the other standard compounds.
- ☒ Raw data has been checked to verify that retention time windows are reported and that all standard compounds are within the windows.
- ☐ Raw data has been checked to verify that the percent breakdown for DDT and endrin does not exceed 20% in the degradation check standard.
- ☒ Raw data has been checked to verify that the percent difference in retention time for the surrogate in all standards and samples does not exceed 0.3% (capillary columns) or 1.5% (wide-bore capillary columns).

**Comments:** None.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 3. INITIAL CALIBRATIONS

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Unless flagged below, a 5-point initial calibration was run. In addition, average Relative Response Factor (RRF), and percent relative Standard Deviation (%RSD) values were within control limits (%RSD  $\leq$  20). For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the low calibration level was not detected, the nondetected results are qualified (UJ).

Comments: 5-point initial calibrations for PCB 1016, 1248 and 1260 were run and %RSD values were within control limits.

### 4. CONTINUING CALIBRATIONS

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Unless flagged below, continuing calibrations were performed at the beginning and at the end of any group of samples and at least every 12 hours. In addition, Relative Response Factors (RRF), and Percent Difference (%D) values were within control limits (%D  $\leq$  15). For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the %D is very high and indicates a severe loss of instrument sensitivity, the associated nondetected results may be qualified as estimated (UJ) or rejected (R) based on the professional judgement of the reviewer.

Comments: None.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 5. LABORATORY CONTROL SAMPLE

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Laboratory Control Samples Analyzed

Laboratory control sample recoveries are used for a qualitative indication of accuracy (bias) independent of matrix effects. Spike recovery limits of 80% to 120% are specified in EPA/540/G-90/004. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). At the discretion of the reviewer, other limits may be used only if justification can be provided.

Comments: None.

### 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

- ☐ Acceptable  
☐ Acceptable with qualification  
☒ Unacceptable  
☐ No Matrix Spike/Matrix Spike Duplicates Analyzed

Matrix spike and matrix spike duplicate recoveries are used for a qualitative indication of accuracy (bias) due to matrix effects. The RPD between the recoveries is used for a qualitative indication of precision. Spike recovery limits of 80% to 120% are specified in EPA/540/G-90/004. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). At the discretion of the reviewer, other limits may be used only if justification can be provided.

Comments: Sample Dico#10 comp was used for MS and MSD, however the parent sample had a high concentration of spiked compound, PCB 1260. MS and MSD did not meet QC criteria due to a high PCB concentration in the spiked sample. LCS and LCD were also analyzed and the recoveries were within the control limits.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 7. BLANKS AND BACKGROUND SAMPLES

☒ Acceptable  
☐ Detection Limits Adjusted

The following blanks were analyzed:

☒ Method (preparation) Blanks  
☐ Field Blanks  
☐ Instrument Blanks  
☐ Rinsate Blanks  
☐ Background Samples  
☐ VOA Trip Blanks

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments: Method blank was free of contamination at reporting limit.

### 8. SURROGATE COMPOUNDS

☐ Acceptable  
☐ Acceptable with qualification  
☒ Unacceptable  
☐ No surrogates analyzed

Surrogate compound recoveries for samples analyzed within a sample group must be within the limits specified in the method. If the surrogate recovery is between 10% and the lower limit, the associated detected results are qualified as estimated (J) and the nondetected results are qualified as estimated (UJ). If the surrogate recovery is <10%, the associated detected results are qualified as estimated (J) and the nondetected results are rejected (R). If the surrogate recovery is above the upper limit, the associated detected results are qualified as estimated (J). Surrogate recoveries which exceeded these limits are noted below and the associated results are qualified on the attached sample report forms. If there are no limits specified in the method, laboratory limits based on historical performance may be used at the discretion of the reviewer.

Comments: Sample Dico5 comp, Dico#11, Dico#15 and Dico#14 required dilution due to the presence of target analytes. The surrogates were diluted out of the samples and the qualification was not required.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 9. INTERNAL STANDARDS

- ☐ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☒ No internal standards analyzed

Internal Standard area counts for samples analyzed within a sample group must be within the range of 50% to 200% of the internal standard area for the continuing calibration. If the internal standard area is between 10% and 50% of this value, the associated detected results are qualified as estimated (J) and the nondetected results are qualified as estimated (UJ). If the internal standard area is <10% of the calibration area, both the detected and nondetected results are rejected (R). If the internal standard area is >200% of the calibration area, the associated detected results are qualified as estimated (J). Internal standards which exceeded these limits are noted below and the associated results are qualified on the attached sample report forms.

Comments:

### 10. DUPLICATE ANALYSES

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Duplicates Analyzed

Type of duplicates analyzed:

- ☒ Field Duplicates  
☐ Laboratory Duplicates

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the equation indicated below. Qualify the results as estimated (J) for any analyte whose RPD exceeds that specified in the Sampling and Analysis Plan.

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Comments:	<u>Dico#11</u>	<u>Dico#15(field duplicate of Dico#11)</u>	<u>RPD</u>
PCB 1260 (mg/kg)	160,000	150,000	6

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 11. ANALYTE IDENTIFICATION

Verify that positive results have been confirmed on a dissimilar second column, that the sample chromatograms agree with the correct daily standard chromatograms, and that the retention time windows match.

Comments: Analyte identification is acceptable.

### 12. ANALYTE QUANTITATION

Confirm that analyte quantitation was performed correctly using the following formulas:

Extractable analyses, water samples:

$$\mu\text{g/L} = \frac{(\text{analyte area})(\text{amount of external standard, ng})(\text{total volume of extract, uL})}{(\text{external standard area})(\text{volume of sample extracted, mL})(\text{injection volume, uL})}$$

Extractable analyses, soil samples:

$$\mu\text{g/kg} = \frac{(\text{analyte area})(\text{amount of external standard, ng})(\text{total volume of extract, uL})}{(\text{external standard area})(\text{weight of sample extracted, g})(\text{fraction solids})(\text{injection volume, uL})}$$

Comments: Analyte quantitation is acceptable. All samples except Dico 1 comp and Dico#12 were extracted with less amount (6g instead of 30g) of sample due to high viscosity and dark colors. Therefore, these samples were initially diluted 5X. All extracts were acid cleaned up for better PCB chromatogram. The laboratory did not reanalyze samples Dico#8 and Dico#13 at a lesser dilution as they should have. This has resulted in the qualification of Dico#8 data, and the notation that aroclors may be present in sample Dico#13 at concentration below the elevated detection limit.



## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 13. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

☐ Acceptable  
☒ Acceptable with Some Qualifications  
☐ Rejected

Accepted data meet the minimum requirements for the following EPA data category:

☐ ERS Screening  
☐ Non-definitive with 10 % Conformation by Definitive Methodology  
☐ Definitive, Comprehensive Statistical Error Determination was performed.  
☒ Definitive, Comprehensive Statistical Error Determination was not performed.

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments: Data as reported is valid.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 14. USABILITY OF DATA

**A. These data are considered usable for the following the data use objectives stated in the EMERGENCY RESPONSE OFFICE AND SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START) QUALITY ASSURANCE SAMPLING PLAN FOR SOIL, DEBRIS AND WATER SAMPLING, DICO OIL, SIGNAL HILL, JUNE 19, 2003 (QASP)**

**The following data use objectives were indicated in the QASP:**

*TO BE COMPARED WITH FEDERAL OR STATE OCCUPATIONAL HEALTH LIMITS (ON-SITE HEALTH AND SAFETY ASSESSMENT DATA).*

*TO BE COMPARED WITH OR OTHER RISK-BASED ACTION LEVELS (E.G. EPA PRELIMINARY REMEDIAL GOALS) TO DETERMINE IF CHRONIC HEALTH THREATS EXIST.*

*THE DATA ARE USABLE FOR THE ABOVE OBJECTIVES.*

**B. These data meet quality objectives stated in the QASP.**

*AS INDICATED IN SECTION 2.3 OF THE QASP, THE INVESTIGATION WILL GENERATE DEFINITIVE DATA AND TABLE E OF THE QASP OUTLINES THE DATA QUALITY INDICATOR GOALS APPLICABLE TO THE DEFINITIVE DATA QUALITY LEVEL. THE DATA IN THIS PACKAGE MEET THESE REQUIREMENTS.*

### 15. DOCUMENTATION OF LABORATORY CORRECTIVE ACTION

**Problem:** The laboratory was contacted to discuss dual-column quantitation. The laboratory did not provide a complete lab chronicle. The laboratory did not reanalyzed some samples at a lesser dilution, resulting in additional qualifications to the data.

**Resolution:** Not required.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### APPENDIX A. ANNOTATED DATA SUMMARY SHEETS

Attached are copies of all data summary sheets, with data qualifiers indicated (hand-annotated), and a copy of the chains of custody for the samples.

When appropriate, the practical quantitation limits have been adjusted to reflect the qualifications noted during the data validation. Errors in the reporting of detected results will not usually be changed by hand. In these cases, the laboratory may be required to re-submit the affected data summary sheets and any associated portions of the data package.

The following data validation qualifiers may be used in this review. Their definitions are taken from the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required practical quantitation limits or because quality control criteria were not met.
- R** The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable. Resampling and/or reanalysis is necessary for verification.
- U** The material was analyzed for, but not detected. The associated numerical value is the sample practical quantitation limit or adjusted sample practical quantitation limit.
- UJ** The material was analyzed for, but not detected. The reported practical quantitation limit is estimated because quality control criteria were not met.
- NJ** Presumptive evidence of the presence of the material (tentatively identified compound) at an estimated quantity.

SW3550B/8082

PCBs

```

=====
Client   : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project  : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No. : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID: DICO 1 COMP                  Date Analyzed: 06/24/03 20:32
Lab Samp ID: F116-01                   Dilution Factor: 1
Lab File ID: WF23071A                  Matrix       : SOIL
Ext Btch ID: 60F019S                  % Moisture    : 5.2
Calib. Ref.: WF23054A                  Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	53	18   18
PCB-1221	ND (ND)	53	18   18
PCB-1232	ND (ND)	53	18   18
PCB-1242	ND (ND)	53	18   18
PCB-1248	ND (ND)	53	18   18
PCB-1254	ND (ND)	53	18   18
PCB-1260	820E (630E) <i>use 5x run</i>	53	18   18

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
DETRACHLORO-M-XYLENE	102 (82)	54-143
DECAHCHLOROBIPHENYL	93 (81)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*Mr. AJ*  
 8/14/03

SW3550B/8082  
PCBs

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 18:30  
Sample ID: DICO 1 COMPDL Date Analyzed: 06/25/03 11:01  
Lab Samp ID: F116-01T Dilution Factor: 5  
Lab File ID: WF23100A Matrix : SOIL  
Ext Btch ID: 60F019S % Moisture : 5.2  
Calib. Ref.: WF23099A Instrument ID : GCT016  
=====

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	260	88 88
PCB-1221	ND (ND)	260	88 88
PCB-1232	ND (ND)	260	88 88
PCB-1242	ND (ND)	260	88 88
PCB-1248	ND (ND)	260	88 88
PCB-1254	ND (ND)	260	88 88
PCB-1260	920 (690)	260	88 88

*use for PCB 1260 only*

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	85 (74)	54-143
DECACHLOROBIPHENYL	85 (77)	36-176

RL: Reporting Limit  
Left of | is related to first column ; Right of | related to second column  
( ) included the reported column  
\* Out side of QC Limit

*USE 920 ug/kg  
Mtd 9-29-03*

*M. J.  
8/14/03*

SW35508/8082  
PCBs

```

=====
Client   : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project  : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No. : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID: DICO 2 COMP                  Date Analyzed: 06/24/03 20:57
Lab Samp ID: F116-02                   Dilution Factor: 5
Lab File ID: WF23072A                  Matrix       : SOIL
Ext Btch ID: 60F019S                  % Moisture    : 11.8
Calib. Ref.: WF23054A                  Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	280	95   95
PCB-1221	ND (ND)	280	95   95
PCB-1232	ND (ND)	280	95   95
PCB-1242	ND (ND)	280	95   95
PCB-1248	ND (ND)	280	95   95
PCB-1254	ND (ND)	280	95   95
PCB-1260	1000 (790)	280	95   95
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
TETRACHLORO-M-XYLENE	99 (84)	54-143	
DECACHLOROBIPHENYL	97 (83)	36-176	

RL: Reporting Limit

—Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*use 1000 ug/kg mtdlu  
9-29-03*

*Am-AJ  
8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                     Date Extracted: 06/23/03 18:30
Sample ID: DICO 6 COMP                   Date Analyzed: 06/25/03 11:26
Lab Samp ID: F116-03                     Dilution Factor: 100
Lab File ID: WF23101A                    Matrix       : SOIL
Ext Btch ID: 60F019S                     % Moisture    : 4.7
Calib. Ref.: WF23099A                     Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	5200	1800 1800
PCB-1221	ND (ND)	5200	1800 1800
PCB-1232	ND (ND)	5200	1800 1800
PCB-1242	ND (ND)	5200	1800 1800
PCB-1248	ND (ND)	5200	1800 1800
PCB-1254	ND (ND)	5200	1800 1800
PCB-1260	35000 (27000)	5200	1800 1800

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	115 (80)	54-143
DECACHLOROBIPHENYL	89 (92)	36-176

RL: Reporting Limit  
Left of | is related to first column ; Right of | related to second column  
( ) included the reported column  
\* Out side of QC Limit

*use 35000 ug/kg*  
*9-24-03*

*M-AJ*  
*8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID:  DICO 7 COMP                    Date Analyzed: 06/25/03 11:51
Lab Samp ID: F116-04                      Dilution Factor: 100
Lab File ID: WF23102A                     Matrix       : SOIL
Ext Btch ID: 60F019S                      % Moisture    : 3.5
Calib. Ref.: WF23099A                     Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	5200	1700   1700
PCB-1221	ND (ND)	5200	1700   1700
PCB-1232	ND (ND)	5200	1700   1700
PCB-1242	ND (ND)	5200	1700   1700
PCB-1248	ND (ND)	5200	1700   1700
PCB-1254	ND (ND)	5200	1700   1700
PCB-1260	33000 (26000)	5200	1700   1700

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEPTACHLORO-M-XYLENE	99 (87)	54-143
DECACHLOROBIPHENYL	100 (85)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 33000 ug/kg m/hls 9-30-03*

*m/hls*  
8/14/03



SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID:  DICO 3 COMP                   Date Analyzed: 06/25/03 12:16
Lab Samp ID: F116-05                     Dilution Factor: 15
Lab File ID: WF23103A                    Matrix       : SOIL
Ext Btch ID: 60F019S                     % Moisture    : 2.5
Calib. Ref.: WF23099A                     Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	770	260   260
PCB-1221	ND (ND)	770	260   260
PCB-1232	ND (ND)	770	260   260
PCB-1242	ND (ND)	770	260   260
PCB-1248	ND (ND)	770	260   260
PCB-1254	ND (ND)	770	260   260
PCB-1260	2500   (2200)	770	260   260

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	85   (67)	54-143
DECACHLOROBIPHENYL	71   (47)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 2500 ug/kg*  
*mykel*  
*9-22-03*

*M. J.*  
*8/14/03*

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : DICO 4 COMP                  Date Analyzed: 06/25/03 12:42
Lab Samp ID : F116-06                     Dilution Factor: 15
Lab File ID : WF23104A                    Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : 2.9
Lab. Ref.: WF23099A                       Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	770	260/260
CB-1221	ND (ND)	770	260/260
CB-1232	ND (ND)	770	260/260
PCB-1242	ND (ND)	770	260/260
PCB-1248	ND (ND)	770	260/260
CB-1254	ND (ND)	770	260/260
CB-1260	3700 (3400)	770	260/260

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	65 (55)	54-143
DECACHLOROBIPHENYL	148 (93)	36-176

RL: Reporting Limit

Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*use 3400 ug/kg*  
*my hew 9-29-03*

*m-j*  
 8/14/03

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                     Date Extracted: 06/23/03 18:30
Sample ID   : DICO 5 COMP                 Date Analyzed: 06/25/03 13:07
Lab Samp ID : F116-07                    Dilution Factor: 250
Lab File ID : WF23105A                   Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : 2.4
Calib. Ref. : WF23099A                   Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	13000	4300
PCB-1221	ND (ND)	13000	4300
PCB-1232	ND (ND)	13000	4300
PCB-1242	ND (ND)	13000	4300
PCB-1248	ND (ND)	13000	4300
PCB-1254	ND (ND)	13000	4300
PCB-1260	75000 (62000)	13000	4300

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	DO DO	54-143
DECACHLOROBIPHENYL	DO DO	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 62000 ug/kg  
 8/14/03*

*8/14/03*

SW35508/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID:  DICO #8                       Date Analyzed: 06/25/03 01:34
Lab Samp ID: F116-08                     Dilution Factor: 5
Lab File ID: WF23083A                    Matrix       : SOIL
Ext Btch ID: 60F019S                     % Moisture    : 4.7
Lab. Ref.:  WF23078A                     Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	260	88 88
CB-1221	ND (ND)	260	88 88
CB-1232	ND (ND)	260	88 88
PCB-1242	ND (ND)	260	88 88
PCB-1248	ND (ND)	260	88 88
CB-1254	ND (ND)	260	88 88
CB-1260	170J (180J)	260	88 88

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
ETRACHLORO-M-XYLENE	77 (68)	54-143
DECACHLOROBIPHENYL	70 (58)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 170J  
180J ng/kg  
9-28-03*

*8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : DICO #9 COMP                 Date Analyzed: 06/25/03 02:00
Lab Samp ID : F116-09                     Dilution Factor: 5
Lab File ID : WF23084A                    Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : 4.2
Calib. Ref. : WF23078A                    Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	260	87 87
PCB-1221	ND (ND)	260	87 87
PCB-1232	ND (ND)	260	87 87
PCB-1242	ND (ND)	260	87 87
PCB-1248	ND (ND)	260	87 87
PCB-1254	ND (ND)	260	87 87
PCB-1260	1900E (1600E) <i>use 15x rim</i>	260	87 87
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
TETRACHLORO-M-XYLENE	102 (80)	54-143	
DECACHLOROBIPHENYL	78 (64)	36-176	

RL: Reporting Limit

Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*mi*  
8/14/03

5182

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : DICO #9 COMPDL              Date Analyzed: 06/25/03 13:32
Lab Samp ID : F116-09T                   Dilution Factor: 15
Lab File ID : WF23106A                   Matrix       : SOIL
Ext Btch ID : 60F019S                    % Moisture    : 4.2
Calib. Ref. : WF23099A                   Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	780	260 260
PCB-1221	ND (ND)	780	260 260
PCB-1232	ND (ND)	780	260 260
PCB-1242	ND (ND)	780	260 260
PCB-1248	ND (ND)	780	260 260
PCB-1254	ND (ND)	780	260 260
PCB-1260	2300 (1900)	780	260 260

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2,4,5-TRACHLORO-M-XYLENE	105 (75)	54-143
DECAChLOROBIPHENYL	83 (71)	36-176

*use for PCB1260 only*

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 2300 ug/kg*  
*9-29-03*

*8/14/03*

SW3550B/8082  
PCBs

```

=====
Client   : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project  : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No. : 03F116                     Date Extracted: 06/23/03 18:30
Sample ID: DICO #10 COMP               Date Analyzed: 06/25/03 02:25
Lab Samp ID: F116-10                   Dilution Factor: 5
Lab File ID: WF23085A                  Matrix       : SOIL
Ext Btch ID: 60F019S                  % Moisture    : 19.0
Calib. Ref.: WF23078A                  Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	310	100 100
PCB-1221	ND (ND)	310	100 100
PCB-1232	ND (ND)	310	100 100
PCB-1242	ND (ND)	310	100 100
PCB-1248	ND (ND)	310	100 100
PCB-1254	ND (ND)	310	100 100
PCB-1260	9400E ( <del>12000E</del> )	310	100 100

*USE 150K run*

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	104 (89)	54-143
DECACHLOROBIPHENYL	81 (69)	36-176

RL: Reporting Limit

Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*m*  
8/14/03

SW3550B/8082  
PCBs

Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 18:30  
Sample ID: DICO #10 COMPDL Date Analyzed: 06/25/03 13:57  
Lab Samp ID: F116-10T Dilution Factor: 100  
Lab File ID: WF23107A Matrix : SOIL  
Ext Btch ID: 60F019S % Moisture : 19.0  
Calib. Ref.: WF23099A Instrument ID : GCT016

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	6200	2100 2100
CB-1221	ND (ND)	6200	2100 2100
CB-1232	ND (ND)	6200	2100 2100
PCB-1242	ND (ND)	6200	2100 2100
PCB-1248	ND (ND)	6200	2100 2100
CB-1254	ND (ND)	6200	2100 2100
CB-1260	25000 (20000)	6200	2100 2100

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEPTACHLORO-M-XYLENE	103 (84)	54-143
DECACHLOROBIPHENYL	99 (75)	36-176

RL: Reporting Limit  
Left of | is related to first column ; Right of | related to second column  
( ) included the reported column  
\* Out side of QC Limit

for  
use PCB 1260 only

use 25000 ug/kg ext 6-29-03

mi AJ  
8/14/03



SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID:  DICO #12                      Date Analyzed: 06/25/03 14:22
Lab Samp ID: F116-11                     Dilution Factor: 20
Lab File ID: WF23108A                    Matrix       : SOIL
Ext Btch ID: 60F019S                     % Moisture    : 6.6
Calib. Ref.: WF23099A                     Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	1100	360 360
PCB-1221	ND (ND)	1100	360 360
PCB-1232	ND (ND)	1100	360 360
PCB-1242	ND (ND)	1100	360 360
PCB-1248	ND (ND)	1100	360 360
PCB-1254	ND (ND)	1100	360 360
PCB-1260	4400 (3500)	1100	360 360

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	103 (85)	54-143
DECACHLOROBIPHENYL	108 (82)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 4400 ug/kg M/L tel 9-22-03*

*M. J. Jay*  
*8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID:  DICO #11                      Date Analyzed: 06/25/03 16:03
Lab Samp ID: F116-12                      Dilution Factor: 500
Lab File ID: WF23112A                     Matrix       : SOIL
Ext Btch ID: 60F019S                      % Moisture    : 19.2
Calib. Ref.: WF23099A                     Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	31000	10000   10000
PCB-1221	ND (ND)	31000	10000   10000
PCB-1232	ND (ND)	31000	10000   10000
PCB-1242	ND (ND)	31000	10000   10000
PCB-1248	ND (ND)	31000	10000   10000
PCB-1254	ND (ND)	31000	10000   10000
PCB-1260	200000   (160000)	31000	10000   10000

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	DO   DO	54-143
DECACHLOROBIPHENYL	DO   DO	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 200000 ug/kg  
 m/felw  
 9-29-03*

*m/felw  
 8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : DICO #15                    Date Analyzed: 06/25/03 16:29
Lab Samp ID : F116-13                     Dilution Factor: 500
Lab File ID : WF23113A                    Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : 19.2
Calib. Ref. : WF23099A                    Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	31000	10000
PCB-1221	ND (ND)	31000	10000
PCB-1232	ND (ND)	31000	10000
PCB-1242	ND (ND)	31000	10000
PCB-1248	ND (ND)	31000	10000
PCB-1254	ND (ND)	31000	10000
PCB-1260	190000 (150000)	31000	10000

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	DO DO	54-143
DECACHLOROBIPHENYL	DO DO	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*use 150000 ug/kg mstela  
9-30-03*

*mstela  
8/14/03*

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : DICO #13                    Date Analyzed: 06/25/03 06:37
Lab Samp ID : F116-14                     Dilution Factor: 30
Lab File ID : WF23095A                    Matrix       : SLUDGE
Ext Btch ID : 60F019S                     % Moisture    : NA
Calib. Ref. : WF23078A                    Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	1500	500 500
PCB-1221	ND (ND)	1500	500 500
PCB-1232	ND (ND)	1500	500 500
PCB-1242	ND (ND)	1500	500 500
PCB-1248	ND (ND)	1500	500 500
PCB-1254	ND (ND)	1500	500 500
PCB-1260	ND (ND)	1500	500 500

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	117 (104)	54-143
DECACHLOROBIPHENYL	104 (68)	36-176

RL: Reporting Limit

Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*use <500 ug/kg for all  
analyzed dioxins. m/fdr  
9-30-03*

*m/fdr  
8/14/03*

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID: DICO #14                      Date Analyzed: 06/25/03 15:38
Lab Samp ID: F116-15                    Dilution Factor: 250
Lab File ID: WF23111A                  Matrix      : SOIL
Ext Btch ID: 60F019S                  % Moisture   : 29.1
Calib. Ref.: WF23099A                  Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	18000	5900 5900
PCB-1221	ND (ND)	18000	5900 5900
PCB-1232	ND (ND)	18000	5900 5900
PCB-1242	ND (ND)	18000	5900 5900
PCB-1248	36000 (31000)	18000	5900 5900
PCB-1254	ND (ND)	18000	5900 5900
PCB-1260	6700J (6600J)	18000	5900 5900

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	DO DO	54-143
DECACHLOROBIPHENYL	DO DO	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

Calib. Ref. file for PCB 1248: WG03007A

*use PCB-1248: 36000 ug/kg  
 PCB-1260: 6700J ug/kg  
 ms/kv 9-30-03*

*ms/kv  
 8/14/03*

5206

SW3550B/8082  
PCBs

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: NA
Project     : DICO SIGNAL HILL             Date Received: 06/23/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : MBLK1S                      Date Analyzed: 06/24/03 18:26
Lab Samp ID : 60F019SB                    Dilution Factor: 1
Lab File ID : WF23066A                    Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : NA
Calib. Ref. : WF23054A                    Instrument ID : GCT016
=====

```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	50	17 17
PCB-1221	ND (ND)	50	17 17
PCB-1232	ND (ND)	50	17 17
PCB-1242	ND (ND)	50	17 17
PCB-1248	ND (ND)	50	17 17
PCB-1254	ND (ND)	50	17 17
PCB-1260	ND (ND)	50	17 17

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	71 (60)	54-143
DECACHLOROBIPHENYL	95 (75)	36-176

RL: Reporting Limit

Left of | is related to first column ; Right of | related to second column

( ) included the reported column

\* Out side of QC Limit

*m. A. J.*  
8/14/03

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: NA
Project     : DICO SIGNAL HILL             Date Received: 06/23/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 18:30
Sample ID   : MBLK2S                      Date Analyzed: 06/25/03 05:21
Lab Samp ID : 60F020SB                    Dilution Factor: 30
Lab File ID : WF23092A                    Matrix       : SOIL
Ext Btch ID : 60F019S                     % Moisture    : NA
Calib. Ref. : WF23078A                    Instrument ID : GCT016
=====
  
```

PARAMETERS	RESULTS (ug/kg)	RL (ug/kg)	MDL (ug/kg)
PCB-1016	ND (ND)	1500	500 500
PCB-1221	ND (ND)	1500	500 500
PCB-1232	ND (ND)	1500	500 500
PCB-1242	ND (ND)	1500	500 500
PCB-1248	ND (ND)	1500	500 500
PCB-1254	ND (ND)	1500	500 500
PCB-1260	ND (ND)	1500	500 500

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	117 (97)	54-143
DECACHLOROBIPHENYL	72 (69)	36-176

RL: Reporting Limit  
 Left of | is related to first column ; Right of | related to second column  
 ( ) included the reported column  
 \* Out side of QC Limit

*Handwritten signature*  
8/14/03

ENVIRONMENTAL PROTECTION AGENCY  
Office of Enforcement

B13

CHAIN OF CUSTODY RECORD

REGION 9  
75 Hawthorne Street  
San Francisco, California 94105

PROJ. NO.		PROJECT NAME					NO. OF CON- TAINERS	REMARKS								
SAMPLERS: (Signature)								<div style="transform: rotate(-45deg); display: inline-block;"> CAM metals PCB's by 8082 TPH / Diesel #0-1 MS + MSD </div>								
DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION											
0346.01.RS	Dico Signal Hill															
Gru. Nelson																
1.	6/20/03	0900	Soil	X		Dico 1 comp	8 oz	X	X	X						
2.	"	0910	"	X		Dico 2 comp	"	X	X	X						
3.	"	0920	"	X		Dico 6 comp	"	X	X	X						
4.	"	0930	"	X		Dico 7 comp	"	X	X	X						
5.	"	1000	"	X		Dico 3 comp	"	X	X	X						
6.	"	1010	"	X		Dico 4 comp	"	X	X	X						
7.	"	1020	"	X		Dico 5 comp	"	X	X	X						
8.	"	1320	Soil		X	Dico #8	"	X	X	X						
9.	"	1330	"	X		Dico #9 comp	"	X	X	X						
10.	"	1340	"	X		Dico #10 comp	8 oz + 4 oz	X	X	X	X					
11.	"	1420	"		X	Dico #12	8 oz	X	X	X						
12.	"	1400	"		X	Dico #11	8 oz	X	X	X						
13.	"	1410	"		X	Dico #15	"	X	X	X						
14.	"	1425	Sludge	X		Dico #13	"	X	X	X						
15.	"	1430	Soil	X		Dico #14	"	X	X	X						
Relinquished by: (Signature)					Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
[Signature]					6/20/03 1530											
Relinquished by: (Signature)					Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Sealed for Laboratory by: (Signature)					Date / Time		Temp.		Seals Intact (Y/N)		Condition / Remarks					
[Signature]					6/20/03 1530		4.8°C		(Y)							

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

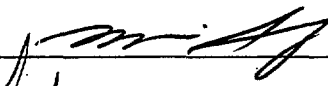
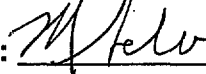
9- 00763



## ANALYTICAL DATA REVIEW SUMMARY

<b>Site Name:</b> Dico Oil <b>Project TDD Number:</b> 09-03-05-0002	<b>Location:</b> Signal Hill, California <b>PAN:</b> 0346.01.RS
<b>Laboratory:</b> EMAX Laboratories, Inc. <b>Sampling Dates:</b> 06/20/03 <b>Analytical Method:</b> CAM METALS (6010B/7471)	<b>Lab Project Number:</b> 03F116 <b>Sample Matrix:</b> Soil <b>Data Reviewer:</b> M. Song

### REVIEW AND APPROVAL:

Data Reviewer: <u>Mindy C. Song</u> 	Date: <u>8/14/03</u>
Technical QA Reviewer: 	Date: <u>9-30-03</u>
Project Manager: <u>J. W. Hays</u>	Date: <u>10/2/03</u>

### SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	Dico 1 comp	03F116-01
2	Dico 2 comp	03F116-02
3	Dico 6 comp	03F116-03
4	Dico 7 comp	03F116-04
5	Dico 3 comp	03F116-01
6	Dico 4 comp	03F116-01
7	Dico 5 comp	03F116-01
8	Dico#8	03F116-01
9	Dico#9 comp	03F116-01
10	Dico#10 comp	03F116-01
11	Dico#12	03F116-01
12	Dico#11	03F116-01
13	Dico#15	03F116-01
14	Dico#13	03F116-01
15	Dico#14	03F116-01
16		
17		
18		
19		
20		

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### DATA PACKAGE COMPLETENESS CHECKLIST:

#### Checklist Code:

- ☒ Included: no problems
- ☐ \* Included: problems noted in review
- ☐ O Not Included and/or Not Available
- ☐ NR Not Required
- ☐ RS Provided As Re-submission

#### Case Narrative:

- ☒ Case Narrative present

#### Quality Control Summary Package:

- ☒ Data Summary sheets
- ☒ Initial and Continuing Calibration results
- ☐ O CRDL Standard results
- ☒ Preparation Blank and Calibration Blank results
- ☒ ICP Interference Check Sample results
- ☒ Matrix Spike recoveries
- ☒ Matrix Duplicate results
- ☒ Laboratory Control Sample recoveries
- ☒ Method of Standard Additions results
- ☒ ICP Serial Dilution results
- ☐ NR Instrument Detection Limits
- ☐ O ICP Interelement Correction Factors
- ☐ O ICP Linear Ranges
- ☒ Preparation Log
- ☒ Analysis Run Log

#### Raw QC Data Package Section

- ☒ Chain-of-Custody Records
- ☒ Instrument Printouts
- ☒ Sample Preparation Notebook Pages
- ☒ Logbook and Worksheet Pages
- ☒ Percent Solids Determination

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### DATA VALIDATION SUMMARY

The data were reviewed following procedures and limits specified in the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

Indicate with a YES or NO whether each item is acceptable:

1	Holding Times	YES
2	Initial and Continuing Calibrations	YES
3	Laboratory Control Sample	YES
4	Matrix Spike	YES
5	Blanks and Background Samples	YES
6	Duplicate Analyses	YES
7	Inductively Coupled Plasma QC	YES
8	Furnace Atomic Absorption QC	N/A
9	Analyte Quantitation	YES
10	Overall Assessment of Data	YES
11	Usability of Data	YES

**Comment :** N/A- Not Applicable

Fourteen soil samples and one sludge sample were delivered to the laboratory for CAM metals by ICP-USEPA Method 6010B/7471 on June 20, 2003 .

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil  
Project TDD Number: 09-03-05-0002

Location: Signal Hill, California  
PAN: 0346.01.RS

### 1. HOLDING TIMES

☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.

All Sample Matrices: —  
Mercury: 28 days (from collection) for analysis. —  
Hexavalent chromium: 24 hours (from collection) for analysis. —  
All other metals: 180 days (from collection) for analysis. —

**Comments:** For CAM metals, samples were analyzed 5 to 6 days from the time of collection.

### 2. INITIAL AND CONTINUING CALIBRATION VERIFICATION

☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Unless flagged below, an initial calibration verification (ICV) and a calibration blank were analyzed at the beginning of the run, and a continuing calibration verification (CCV) and a calibration blank were analyzed after every ten samples, and at the end of the run. ICV and CCV recoveries were within a range of 80-120% for mercury and tin, and 90-110% for all other metals. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 65% or above 135% (for mercury and tin) or below 75% or above 125% (for all other metals), all associated data are rejected (R).

**Comments:** All recoveries of CAM metals in initial and continuing calibration verification were within the control limits.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 3. LABORATORY CONTROL SAMPLE

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Laboratory Control Samples Analyzed

Laboratory control sample recoveries are used for a qualitative indication of accuracy (bias) independent of matrix effects. Unless flagged below, one laboratory control sample was analyzed at a rate of one per batch or one per 20 samples. Recoveries were within a range of 80-120%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

**Comments:** Percent recoveries of LCS were within the control limits.

### 4. MATRIX SPIKE

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Matrix Spikes Analyzed

Matrix spike recoveries are used for a qualitative indication of accuracy (bias) due to matrix effects. Unless flagged below, one laboratory control sample was analyzed at a rate of one per batch or one per 20 samples. Recoveries were within a range of 75-125%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

**Comments:** Sample Dico#10 comp was used for matrix spike and matrix spike duplicate. All recoveries were within a range of 75-125%.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 5. BLANKS AND BACKGROUND SAMPLES

☒ Acceptable  
☐ Detection Limits Adjusted

The following blanks were analyzed:

☒ Method (preparation) Blanks  
☐ Field Blanks  
☐ Calibration Blanks  
☐ Rinsate Blanks  
☐ Background Samples

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments: Method blanks were free of contamination at reporting limit level.

### 6. DUPLICATE ANALYSES

☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Duplicates Analyzed

Type of duplicates analyzed:

☒ Field Duplicates  
☐ Laboratory Duplicates

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the equation indicated below. Qualify the detected results as estimated (J) for any analyte whose RPD in a laboratory duplicate exceeds 20% for water samples or 35% for soil samples.

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Comments: Sample Dico#15 is a field duplicate of Dico#11 and RPDs were less than 35%.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

Analyte	Dico#11 (mg/kg)	Dico#15 (mg/kg)	RPD
Antimony	3.17J	ND	NC
Barium	364	358	2
Beryllium	0.342J	0.336J	NC
Cadmium	2.49	2.89	15
Chromium	22.4	23.1	3
Cobalt	9.95	10.1	1
Copper	48.6	44.7	8
Molybdenum	2.03J	1.3J	NC
Nickel	23.4	25	7
Silver	ND	ND	0
Vanadium	23.5	24	2
Zinc	235	242	3
Arsenic	8.58	7.64	12
Lead	769	701	9
Selenium	ND	ND	0
Thallium	ND	ND	0
Mercury	0.782	0.943	19

ND: Not Detected

NC: Not Calculated

J: The result is an estimated concentration that is less than the reporting limit but greater than or above the method detection limit.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 7. INDUCTIVELY COUPLED PLASMA QC

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ Not required

Interference Check Samples (ICS) - Unless flagged below, an ICS was analyzed at the beginning and end of each run and at least twice every eight hours. Recoveries were within a range of 80-120%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J) if the concentrations of Al, Ca, Fe, or Mg are higher in the sample than in the ICS.

Serial Dilution Analysis - Unless flagged below, a serial dilution analysis was performed at a rate of one per 20 samples on a sample having analyte concentrations greater than 50 times the IDL. Percent differences were within a range of 0-10%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J).

Comments: ICS- All recoveries were within the control limits.

Serial Dilution Analysis- Sample Dico#10 comp was used and percent differences(%D) were within a range of 0-10%.

### 8. FURNACE ATOMIC ABSORPTION QC

- ☐ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☒ Not required

Post-digestion spikes - If a furnace AA result was flagged by the laboratory with an E to indicate interference, and the associated post-digestion spike recovery was less than 10%, the associated results are rejected (R).

Method of Standard Additions - If the method of standard additions was required and the correlation coefficient was less than 0.995, the associated results were qualified as estimated (J).

Comments:



## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil	Location: Signal Hill, California
Project TDD Number: 09-03-05-0002	PAN: 0346.01.RS

### 9. ANALYTE QUANTITATION

Confirm that analyte quantitation was performed correctly using the following formulas:

Water samples:

$$\text{ug/L} = \frac{(\text{Instrument printout concentration, mg/L})(1000 \text{ ug/mg})(\text{final volume of extract, mL})}{(\text{Initial volume of extract, mL})}$$

Soil samples:

$$\text{mg/kg} = \frac{(\text{Instrument printout concentration, mg/L})(\text{final volume of extract, mL})(0.001 \text{ L/mL})}{(\text{weight of sample extracted, g})(0.001 \text{ kg/g})(\text{fraction solids})}$$

Comments: Analyte quantitation is acceptable.

### 10. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

☒ Acceptable  
☐ Acceptable with Qualification  
☐ Rejected

Accepted data meet the minimum requirements for the following EPA data category:

☐ ERS Screening  
☐ Non-definitive with 10 % Confirmation by Definitive Methodology  
☐ Definitive, Comprehensive Statistical Error Determination was performed.  
☒ Definitive, Comprehensive Statistical Error Determination was not performed.

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments: Data as reported is valid.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 11. USABILITY OF DATA

**A. These data are considered usable for the following the data use objectives stated in the EMERGENCY RESPONSE OFFICE AND SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START) QUALITY ASSURANCE SAMPLING PLAN FOR SOIL, DEBRIS AND WATER SAMPLING, DICO OIL, SIGNAL HILL, JUNE 19, 2003 (QASP)**

**The following data use objectives were indicated in the QASP:**

*TO BE COMPARED WITH FEDERAL OR STATE OCCUPATIONAL HEALTH LIMITS (ON-SITE HEALTH AND SAFETY ASSESSMENT DATA).*

*TO BE COMPARED WITH OR OTHER RISK-BASED ACTION LEVELS (E.G. EPA PRELIMINARY REMEDIAL GOALS) TO DETERMINE IF CHRONIC HEALTH THREATS EXIST.*

*THE DATA ARE USABLE FOR THE ABOVE OBJECTIVES.*

**B. These data meet quality objectives stated in the QASP.**

*AS INDICATED IN SECTION 2.3 OF THE QASP, THE INVESTIGATION WILL GENERATE DEFINITIVE DATA AND TABLE E OF THE QASP OUTLINES THE DATA QUALITY INDICATOR GOALS APPLICABLE TO THE DEFINITIVE DATA QUALITY LEVEL. THE DATA IN THIS PACKAGE MEET THESE REQUIREMENTS.*

### 12. DOCUMENTATION OF LABORATORY CORRECTIVE ACTION

**Problem:** No problems requiring corrective action were found.

**Resolution:** Not required.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil	Location: Signal Hill, California
Project TDD Number: 09-03-05-0002	PAN: 0346.01.RS

### APPENDIX A. ANNOTATED DATA SUMMARY SHEETS

Attached are copies of all data summary sheets, with data qualifiers indicated (hand-annotated), and a copy of the chains of custody for the samples.

When appropriate, the practical quantitation limits have been adjusted to reflect the qualifications noted during the data validation. Errors in the reporting of detected results will not usually be changed by hand. In these cases, the laboratory may be required to re-submit the affected data summary sheets and any associated portions of the data package.

The following data validation qualifiers may be used in this review. Their definitions are taken from the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required practical quantitation limits or because quality control criteria were not met.
- R** The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable. Resampling and/or reanalysis is necessary for verification.
- U** The material was analyzed for, but not detected. The associated numerical value is the sample practical quantitation limit or adjusted sample practical quantitation limit.
- UJ** The material was analyzed for, but not detected. The reported practical quantitation limit is estimated because quality control criteria were not met.
- NJ** Presumptive evidence of the presence of the material (tentatively identified compound) at an estimated quantity.

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 1 COMP Date Analyzed: 06/25/03 19:45  
Lab Samp ID: F116-01 Dilution Factor: 1  
Lab File ID: 107F020013 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 5.2  
Calib. Ref.: 107F020008 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10.5	2.22
Barium	132	1.05	.131
Beryllium	.33J	1.05	.124
Cadmium	.777J	1.05	.382
Chromium	18.3	2.11	.648
Cobalt	5.06	2.11	.729
Copper	24.4	2.11	.498
Molybdenum	ND	5.27	.778
Nickel	10.7	2.11	.58
Silver	ND	2.11	.662
Vanadium	22.9	2.11	.462
Zinc	163	1.05	.304

RL: Reporting Limit

*m-af*  
8/5/03

SW3050B/6010B  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 1 COMP Date Analyzed: 06/25/03 20:29  
Lab Samp ID: F116-01 Dilution Factor: 1  
Lab File ID: I31F020013 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 5.2  
Lab. Ref.: I31F020008 Instrument ID : EMAXT131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	3.81	1.05	.222
Lead	78.1	1.05	.184
Selenium	ND	1.05	.301
Mercury	ND	1.05	.322

RL: Reporting Limit

*M. J.*  
8/5/03

SW3050B/6010B  
METALS BY ICP

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=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
SDG NO.    : 03F116                       Date Extracted: 06/24/03 15:15
Sample ID: DICO 2 COMP                     Date Analyzed: 06/25/03 19:50
Lab Samp ID: F116-02                      Dilution Factor: 1
Lab File ID: I07F020014                   Matrix       : SOIL
Ext Btch ID: IPF044S                      % Moisture   : 11.8
Calib. Ref.: I07F020008                   Instrument ID : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	2.38J	11.3	2.38
Barium	150	1.13	.141
Beryllium	.308J	1.13	.134
Cadmium	.976J	1.13	.41
Chromium	16	2.27	.696
Cobalt	8.27	2.27	.783
Copper	33	2.27	.535
Molybdenum	ND	5.67	.837
Nickel	17.8	2.27	.624
Silver	ND	2.27	.712
Vanadium	22	2.27	.497
Zinc	163	1.13	.327

RL: Reporting Limit

*M. J.*  
8/5/03

SW30508/60108  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO 2 COMP	Date Analyzed:	06/25/03 20:35
Lab Samp ID:	F116-02	Dilution Factor:	1
Lab File ID:	I31F020014	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 11.8
Calib. Ref.:	I31F020008	Instrument ID	: EMAXT131

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	4.67	1.13	.239
Lead	59.1	1.13	.197
Selenium	ND	1.13	.323
Barium	.764J	1.13	.346

RL: Reporting Limit

*mm-AJ*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 6 COMP Date Analyzed: 06/25/03 19:54  
Lab Samp ID: F116-03 Dilution Factor: 1  
Lab File ID: 107F020015 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 4.7  
Calib. Ref.: 107F020008 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	4.25J	10.5	2.21
Barium	594	1.05	.13
Beryllium	.269J	1.05	.124
Cadmium	.9J	1.05	.38
Chromium	34.8	2.1	.644
Cobalt	64.3	2.1	.725
Copper	45.7	2.1	.495
Molybdenum	118	5.25	.774
Nickel	18.3	2.1	.577
Silver	ND	2.1	.659
Vanadium	36.6	2.1	.46
Zinc	276	1.05	.302

RL: Reporting Limit

*m-af*  
8/5/03



SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO 6 COMP	Date Analyzed:	06/25/03 20:40
Lab Samp ID:	F116-03	Dilution Factor:	1
Lab File ID:	I31F020015	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 4.7
Calib. Ref.:	I31F020008	Instrument ID	: EMAXT131

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	7.21	1.05	.221
Lead	214	1.05	.183
Selenium	ND	1.05	.299
Thallium	ND	1.05	.32

RL: Reporting Limit

*M. J.*  
8/5/03

SW3050B/6010B  
METALS BY ICP

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=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
SDG NO.    : 03F116                       Date Extracted: 06/24/03 15:15
Sample ID: DICO 7 COMP                     Date Analyzed: 06/25/03 19:59
Lab Samp ID: F116-04                       Dilution Factor: 1
Lab File ID: I07F020016                   Matrix          : SOIL
Ext Btch ID: IPF044S                       % Moisture      : 3.5
Calib. Ref.: I07F020008                   Instrument ID   : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	2.71J	10.4	2.18
Barium	298	1.04	.128
Beryllium	.277J	1.04	.122
Cadmium	1.93	1.04	.375
Chromium	27.5	2.07	.636
Cobalt	6.13	2.07	.716
Copper	43.1	2.07	.489
Molybdenum	ND	5.18	.765
Nickel	38	2.07	.57
Silver	ND	2.07	.651
Vanadium	41.3	2.07	.454
Zinc	303	1.04	.298

RL: Reporting Limit

*mi-AJ*  
8/5/03

SW30508/60108  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 7 COMP Date Analyzed: 06/25/03 20:46  
Lab Samp ID: F116-04 Dilution Factor: 1  
Lab File ID: I31F020016 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 3.5  
Calib. Ref.: I31F020008 Instrument ID : EMAXI131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	7.11	1.04	.218
Lead	282	1.04	.18
Selenium	ND	1.04	.295
Thallium	ND	1.04	.316

RL: Reporting Limit

*M. J.*  
8/5/03

7011

SW30508/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 3 COMP Date Analyzed: 06/25/03 20:04  
Lab Samp ID: F116-05 Dilution Factor: 1  
Lab File ID: I07F020017 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 2.5  
Calib. Ref.: I07F020008 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10.3	2.16
Barium	171	1.03	.127
Beryllium	.257J	1.03	.121
Cadmium	.732J	1.03	.371
Chromium	21.7	2.05	.63
Cobalt	4.91	2.05	.709
Copper	25.8	2.05	.484
Molybdenum	ND	5.13	.757
Nickel	13.9	2.05	.564
Silver	ND	2.05	.644
Vanadium	24.2	2.05	.449
Zinc	113	1.03	.295

RL: Reporting Limit

*mi AJ*  
8/5/03

SW3050B/6010B  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 3 COMP Date Analyzed: 06/25/03 20:51  
Lab Samp ID: F116-05 Dilution Factor: 1  
Lab File ID: I31F020017 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 2.5  
Lab. Ref.: I31F020008 Instrument ID : EMAXT131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	4.98	1.03	.216
Lead	127	1.03	.179
Selenium	ND	1.03	.292
Thallium	ND	1.03	.313

RL: Reporting Limit

*Mr. J*  
8/5/03

SW30508/60108  
METALS BY ICP

=====

Client : ECOLOGY AND ENVIRONMENT.	Date Collected: 06/20/03
Project : DICO SIGNAL HILL	Date Received: 06/20/03
SDG NO. : 03F116	Date Extracted: 06/24/03 15:15
Sample ID: DICO 4 COMP	Date Analyzed: 06/25/03 20:08
Lab Samp ID: F116-06	Dilution Factor: 1
Lab File ID: 107F020018	Matrix : SOIL
Ext Btch ID: IPF044S	% Moisture : 2.9
Calib. Ref.: 107F020008	Instrument ID : EMAXT107

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	8.45J	10.3	2.17
Barium	2090	1.03	.128
Beryllium	.312J	1.03	.122
Cadmium	3.03	1.03	.373
Chromium	76	2.06	.632
Cobalt	9.21	2.06	.712
Copper	138	2.06	.486
Molybdenum	10.4	5.15	.76
Nickel	47	2.06	.566
Silver	ND	2.06	.647
Vanadium	41.5	2.06	.451
Zinc	577	1.03	.297

RL: Reporting Limit

*m-af*  
8/5/03

7014

SW3050B/6010B  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 4 COMP Date Analyzed: 06/25/03 20:57  
Lab Samp ID: F116-06 Dilution Factor: 1  
Lab File ID: I31F020018 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 2.9  
Calib. Ref.: I31F020008 Instrument ID : EMAXT131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	17.8	1.03	.217
Lead	1000	1.03	.179
Selenium	ND	1.03	.293
Thallium	ND	1.03	.314

RL: Reporting Limit

*M. J.*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO 5 COMP Date Analyzed: 06/25/03 20:13  
Lab Samp ID: F116-07 Dilution Factor: 1  
Lab File ID: I07F020019 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 2.4  
Calib. Ref.: I07F020008 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	26.6	10.2	2.15
Barium	1190	1.02	.127
Beryllium	.521J	1.02	.121
Cadmium	2.31	1.02	.371
Chromium	54.8	2.05	.629
Cobalt	8.16	2.05	.708
Copper	89	2.05	.484
Molybdenum	11.9	5.12	.756
Nickel	37.5	2.05	.564
Silver	ND	2.05	.643
Vanadium	43.5	2.05	.449
Zinc	337	1.02	.295

RL: Reporting Limit

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8/5/03



SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO 5 COMP	Date Analyzed:	06/25/03 21:03
Lab Samp ID:	F116-07	Dilution Factor:	1
Lab File ID:	I31F020019	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 2.4
Calib. Ref.:	I31F020008	Instrument ID	: EMAXTI31

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	8.6	1.02	.216
Lead	264	1.02	.178
Selenium	ND	1.02	.292
Thallium	ND	1.02	.313

RL: Reporting Limit

*M. J. J.*  
8/5/03

SW3050B/6010B  
METALS BY ICP

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=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
SDG NO.    : 03F116                       Date Extracted: 06/24/03 15:15
Sample ID: DICO #8                         Date Analyzed: 06/25/03 20:27
Lab Samp ID: F116-08                       Dilution Factor: 1
Lab File ID: I07F020022                    Matrix       : SOIL
Ext Btch ID: IPF044S                       % Moisture    : 4.7
Calib. Ref.: I07F020020                    Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10.5	2.21
Barium	39.9	1.05	.13
Beryllium	ND	1.05	.124
Cadmium	ND	1.05	.38
Chromium	5.18	2.1	.644
Cobalt	3.43	2.1	.725
Copper	20.1	2.1	.495
Molybdenum	ND	5.25	.774
Nickel	4.82	2.1	.577
Silver	ND	2.1	.659
Vanadium	11.7	2.1	.46
Zinc	129	1.05	.302

RL: Reporting Limit

*mi*  
8/5/03

7018

SW3050B/6010B  
METALS BY TRACE ICP

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Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #8	Date Analyzed:	06/25/03 21:19
Lab Samp ID:	F116-08	Dilution Factor:	1
Lab File ID:	I31F020022	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 4.7
Calib. Ref.:	I31F020020	Instrument ID	: EMAXT131

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	2.54	1.05	.221
Lead	11.4	1.05	.183
Selenium	ND	1.05	.299
Thallium	ND	1.05	.32

RL: Reporting Limit

*mj*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #9 COMP Date Analyzed: 06/25/03 20:31  
Lab Samp ID: F116-09 Dilution Factor: 1  
Lab File ID: 107F020023 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 4.2  
Calib. Ref.: 107F020020 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10.4	2.2
Barium	112	1.04	.129
Beryllium	.25J	1.04	.123
Cadmium	.597J	1.04	.378
Chromium	13.2	2.09	.641
Cobalt	4.55	2.09	.721
Copper	35	2.09	.493
Molybdenum	.908J	5.22	.77
Nickel	8.61	2.09	.574
Silver	ND	2.09	.656
Vanadium	19.6	2.09	.457
Zinc	215	1.04	.301

RL: Reporting Limit

*m-jf*  
8/5/03

7020

SW3050B/6010B  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #9 COMP Date Analyzed: 06/25/03 21:25  
Lab Samp ID: F116-09 Dilution Factor: 1  
Lab File ID: I31F020023 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 4.2  
Calib. Ref.: I31F020020 Instrument ID : EMAXT131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	3.14	1.04	.22
Lead	49.5	1.04	.182
Selenium	ND	1.04	.297
Thallium	ND	1.04	.318

RL: Reporting Limit

*mif*  
8/5/03

SW30508/60108  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #10 COMP Date Analyzed: 06/25/03 20:36  
Lab Samp ID: F116-10 Dilution Factor: 1  
Lab File ID: 107F020024 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 19.0  
Calib. Ref.: 107F020020 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	12.3	2.6
Barium	212	1.23	.153
Beryllium	.484J	1.23	.146
Cadmium	1.12J	1.23	.447
Chromium	24.9	2.47	.758
Cobalt	6.58	2.47	.853
Copper	37.4	2.47	.583
Molybdenum	ND	6.17	.911
Nickel	14.8	2.47	.679
Silver	ND	2.47	.775
Vanadium	30.5	2.47	.541
Zinc	310	1.23	.356

RL: Reporting Limit

*m. j.*  
8/5/03

SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #10 COMP	Date Analyzed:	06/25/03 21:30
Lab Samp ID:	F116-10	Dilution Factor:	1
Lab File ID:	I31F020024	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 19.0
Calib. Ref.:	I31F020020	Instrument ID	: EMAXI31

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	4.91	1.23	.26
Lead	84.9	1.23	.215
Selenium	ND	1.23	.352
Thallium	ND	1.23	.377

RL: Reporting Limit

*mi*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #12 Date Analyzed: 06/25/03 21:03  
Lab Samp ID: F116-11 Dilution Factor: 1  
Lab File ID: I07F020029 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 6.6  
Calib. Ref.: I07F020020 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	2.46J	10.7	2.25
Barium	262	1.07	.133
Beryllium	.758J	1.07	.126
Cadmium	1.07	1.07	.388
Chromium	36.5	2.14	.657
Cobalt	14.9	2.14	.74
Copper	46.8	2.14	.505
Molybdenum	ND	5.35	.79
Nickel	27.2	2.14	.589
Silver	ND	2.14	.672
Vanadium	60.9	2.14	.469
Zinc	142	1.07	.308

RL: Reporting Limit

*m. Af*  
8/5/03

7024



SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #12	Date Analyzed:	06/25/03 21:58
Lab Samp ID:	F116-11	Dilution Factor:	1
Lab File ID:	131F020029	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 6.6
Calib. Ref.:	131F020020	Instrument ID	: EMAXT131

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	11	1.07	.225
Lead	29.4	1.07	.186
Selenium	ND	1.07	.305
Thallium	.46J	1.07	.327

RL: Reporting Limit

*m-2A*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #11 Date Analyzed: 06/25/03 21:08  
Lab Samp ID: F116-12 Dilution Factor: 1  
Lab File ID: 107F020030 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 19.2  
Calib. Ref.: 107F020020 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	3.17J	12.4	2.6
Barium	364	1.24	.153
Beryllium	.342J	1.24	.146
Cadmium	2.49	1.24	.448
Chromium	22.4	2.48	.76
Cobalt	9.95	2.48	.855
Copper	48.6	2.48	.584
Molybdenum	2.03J	6.19	.913
Nickel	23.4	2.48	.681
Silver	ND	2.48	.777
Vanadium	23.5	2.48	.542
Zinc	235	1.24	.356

RL: Reporting Limit

*m. Af*  
8/5/03

7026

SW30508/60108  
METALS BY TRACE ICP

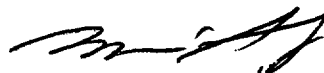
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Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #11	Date Analyzed:	06/25/03 22:04
Lab Samp ID:	F116-12	Dilution Factor:	1
Lab File ID:	I31F020030	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 19.2
Calib. Ref.:	I31F020020	Instrument ID	: EMAXTI31

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	8.58	1.24	.26
Lead	769	1.24	.215
Selenium	ND	1.24	.353
Thallium	ND	1.24	.378

RL: Reporting Limit

  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #15 Date Analyzed: 06/25/03 21:13  
Lab Samp ID: F116-13 Dilution Factor: 1  
Lab File ID: I07F020031 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 19.2  
Calib. Ref.: I07F020020 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	12.4	2.6
Barium	358	1.24	.153
Beryllium	.336J	1.24	.146
Cadmium	2.89	1.24	.448
Chromium	23.1	2.48	.76
Cobalt	10.1	2.48	.855
Copper	44.7	2.48	.584
Molybdenum	1.3J	6.19	.913
Nickel	25	2.48	.681
Silver	ND	2.48	.777
Vanadium	24	2.48	.542
Zinc	242	1.24	.356

RL: Reporting Limit

*M. J.*  
8/5/03

SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #15	Date Analyzed:	06/25/03 22:09
Lab Samp ID:	F116-13	Dilution Factor:	1
Lab File ID:	I31F020031	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 19.2
Calib. Ref.:	I31F020020	Instrument ID	: EMAXI31

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	7.64	1.24	.26
Lead	701	1.24	.215
Selenium	ND	1.24	.353
Thallium	ND	1.24	.378

RL: Reporting Limit

*m-jf*  
8/5/03

SW3050B/6010B  
METALS BY ICP

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=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
SDG NO.    : 03F116                       Date Extracted: 06/24/03 15:15
Sample ID: DICO #13                       Date Analyzed: 06/25/03 21:27
Lab Samp ID: F116-14                     Dilution Factor: 1
Lab File ID: I07F020034                  Matrix          : SLUDGE
Ext Btch ID: IPF044S                     % Moisture      : NA
Calib. Ref.: I07F020032                  Instrument ID   : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10	2.1
Barium	2	1	.124
Beryllium	ND	1	.118
Cadmium	ND	1	.362
Chromium	ND	2	.614
Cobalt	ND	2	.691
Copper	14.7	2	.472
Molybdenum	2.68J	5	.738
Nickel	ND	2	.55
Silver	ND	2	.628
Vanadium	ND	2	.438
Zinc	107	1	.288

RL: Reporting Limit

*m-107*  
8/5/03

SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #13	Date Analyzed:	06/25/03 22:26
Lab Samp ID:	F116-14	Dilution Factor:	1
Lab File ID:	I31F020034	Matrix	: SLUDGE
Ext Btch ID:	IPF044S	% Moisture	: NA
Calib. Ref.:	I31F020032	Instrument ID	: EMAXT131

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	ND	1	.21
Lead	8.19	1	.174
Selenium	ND	1	.285
Thallium	ND	1	.305

RL: Reporting Limit

*M. J.*  
8/5/03

7031

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: DICO #14 Date Analyzed: 06/25/03 21:31  
Lab Samp ID: F116-15 Dilution Factor: 1  
Lab File ID: I07F020035 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : 29.1  
Calib. Ref.: I07F020032 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	25.6	14.1	2.97
Barium	8420	1.41	.175
Beryllium	.516J	1.41	.166
Cadmium	7.73	1.41	.511
Chromium	484	2.82	.866
Cobalt	32.4	2.82	.975
Copper	668	2.82	.666
Molybdenum	70.6	7.05	1.04
Nickel	367	2.82	.776
Silver	ND	2.82	.886
Vanadium	234	2.82	.618
Zinc	1530	1.41	.406

RL: Reporting Limit

*mia*  
8/5/03

7032



SW3050B/6010B  
METALS BY TRACE ICP

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
SDG NO.	: 03F116	Date Extracted:	06/24/03 15:15
Sample ID:	DICO #14	Date Analyzed:	06/25/03 22:31
Lab Samp ID:	F116-15	Dilution Factor:	1
Lab File ID:	I31F020035	Matrix	: SOIL
Ext Btch ID:	IPF044S	% Moisture	: 29.1
Calib. Ref.:	I31F020032	Instrument ID	: EMAXTI31

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	30.9	1.41	.297
Lead	1640	1.41	.246
Selenium	1.96	1.41	.402
Thallium	2.41	1.41	.43

RL: Reporting Limit

*m-aj*  
8/5/03

SW3050B/6010B  
METALS BY ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: NA  
Project : DICO SIGNAL HILL Date Received: 06/24/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: MBLK1S Date Analyzed: 06/25/03 19:29  
Lab Samp ID: IPF044SB Dilution Factor: 1  
Lab File ID: I07F020010 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : NA  
Calib. Ref.: I07F020008 Instrument ID : EMAXT107  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Antimony	ND	10	2.1
Barium	ND	1	.124
Beryllium	ND	1	.118
Cadmium	ND	1	.362
Chromium	ND	2	.614
Cobalt	ND	2	.691
Copper	ND	2	.472
Molybdenum	ND	5	.738
Nickel	ND	2	.55
Silver	ND	2	.628
Vanadium	ND	2	.438
Zinc	ND	1	.288

RL: Reporting Limit

*mit*  
8/5/03

7034

SW3050B/6010B  
METALS BY TRACE ICP

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: NA  
Project : DICO SIGNAL HILL Date Received: 06/24/03  
SDG NO. : 03F116 Date Extracted: 06/24/03 15:15  
Sample ID: MBLK1S Date Analyzed: 06/25/03 20:12  
Lab Samp ID: IPF044SB Dilution Factor: 1  
Lab File ID: I31F020010 Matrix : SOIL  
Ext Btch ID: IPF044S % Moisture : NA  
Calib. Ref.: I31F020008 Instrument ID : EMAXT131  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
Arsenic	ND	1	.21
Lead	.203J	1	.174
Selenium	ND	1	.285
Thallium	ND	1	.305

RL: Reporting Limit

*m. J.*  
8/5/03

METHOD 7471A  
MERCURY BY COLD VAPOR

Client : ECOLOGY AND ENVIRONMENT  
Project : DICO SIGNAL HILL  
Batch No. : 03F116

Matrix : SOIL  
Instrument ID : T1047

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/kg)	DLF	MOIST	RL (mg/kg)	MDL (mg/kg)	Analysis DATETIME	Extraction DATETIME	LFID	CAL REF	PREP BATCH	Collection DATETIME	Received DATETIME
MBLK1S	HGF030SB	ND	1	NA	.1	.033	06/26/0311:18	06/25/0316:00	M47F020010	M47F020008	HGF030S	NA	06/25/03
LCS1S	HGF030SL	.847	1	NA	.1	.033	06/26/0311:21	06/25/0316:00	M47F020011	M47F020008	HGF030S	NA	06/25/03
LCD1S	HGF030SC	.848	1	NA	.1	.033	06/26/0311:23	06/25/0316:00	M47F020012	M47F020008	HGF030S	NA	06/25/03
DICO #10 COMPAS	F116-10A	.574	1	19.0	.123	.0407	06/26/0311:25	06/25/0316:00	M47F020013	M47F020008	HGF030S	06/20/03	06/20/03
DICO #10 COMP	F116-10	.173	1	19.0	.123	.0407	06/26/0311:28	06/25/0316:00	M47F020014	M47F020008	HGF030S	06/20/03	06/20/03
DICO #10 COMPD	F116-10T	ND	5	19.0	.617	.204	06/26/0311:30	06/25/0316:00	M47F020015	M47F020008	HGF030S	06/20/03	06/20/03
DICO #10 COMPM	F116-10M	1.27	1	19.0	.123	.0407	06/26/0311:32	06/25/0316:00	M47F020016	M47F020008	HGF030S	06/20/03	06/20/03
DICO #10 COMPM	F116-10S	1.21	1	19.0	.123	.0407	06/26/0311:34	06/25/0316:00	M47F020017	M47F020008	HGF030S	06/20/03	06/20/03
DICO 1 COMP	F116-01	.542	1	5.2	.105	.0348	06/26/0311:37	06/25/0316:00	M47F020018	M47F020008	HGF030S	06/20/03	06/20/03
DICO 2 COMP	F116-02	.314	1	11.8	.113	.0374	06/26/0311:39	06/25/0316:00	M47F020019	M47F020008	HGF030S	06/20/03	06/20/03
DICO 6 COMP	F116-03	.451	1	4.7	.105	.0346	06/26/0311:46	06/25/0316:00	M47F020022	M47F020020	HGF030S	06/20/03	06/20/03
DICO 7 COMP	F116-04	.836	1	3.5	.104	.0342	06/26/0311:48	06/25/0316:00	M47F020023	M47F020020	HGF030S	06/20/03	06/20/03
DICO 3 COMP	F116-05	.323	1	2.5	.103	.0338	06/26/0311:50	06/25/0316:00	M47F020024	M47F020020	HGF030S	06/20/03	06/20/03
DICO 5 COMP	F116-07	1.68	1	2.4	.102	.0338	06/26/0311:55	06/25/0316:00	M47F020026	M47F020020	HGF030S	06/20/03	06/20/03
DICO #8	F116-08	ND	1	4.7	.105	.0346	06/26/0311:57	06/25/0316:00	M47F020027	M47F020020	HGF030S	06/20/03	06/20/03
DICO #9 COMP	F116-09	.0919J	1	4.2	.104	.0344	06/26/0311:59	06/25/0316:00	M47F020028	M47F020020	HGF030S	06/20/03	06/20/03
DICO #12	F116-11	.25	1	6.6	.107	.0353	06/26/0312:02	06/25/0316:00	M47F020029	M47F020020	HGF030S	06/20/03	06/20/03
DICO #11	F116-12	.782	1	19.2	.124	.0408	06/26/0312:05	06/25/0316:00	M47F020030	M47F020020	HGF030S	06/20/03	06/20/03
DICO #15	F116-13	.943	1	19.2	.124	.0408	06/26/0312:07	06/25/0316:00	M47F020031	M47F020020	HGF030S	06/20/03	06/20/03
DICO #13	F116-14*	.0432J	1	NA	.1	.033	06/26/0312:14	06/25/0316:00	M47F020034	M47F020032	HGF030S	06/20/03	06/20/03
DICO 4 COMP	F116-06	2.3	5	2.9	.515	.17	06/26/0312:18	06/25/0316:00	M47F020036	M47F020032	HGF030S	06/20/03	06/20/03
DICO #14	F116-15	9.1	10	29.1	1.41	.465	06/26/0312:23	06/25/0316:00	M47F020037	M47F020032	HGF030S	06/20/03	06/20/03

RL: Reporting Limit  
\* : Sludge sample

7146

*am-AJ*  
8/5/03

B13

# CHAIN OF CUSTODY RECORD

REGION 9  
75 Hawthorne Street  
San Francisco, California 94105

PROJ. NO.		PROJECT NAME					NO. OF CONTAINERS	REMARKS									
SAMPLERS: (Signature)								<div style="display: flex; justify-content: space-between;"> <div> CAM Metals PCB's by 8002 TPH / Diesel #0-1 MS + MSD </div> <div>03 F116</div> </div>									
DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION												
1.	6/20/03	0900	Soil	X		Dico 1 comp	8 oz	X	X	X							
2.	"	0910	"	X		Dico 2 comp	"	X	X	X							Send the report to Ben Castellana Ecology & Environment
3.	"	0920	"	X		Dico 6 comp	"	X	X	X							
4.	"	0930	"	X		Dico 7 comp	"	X	X	X							
5.	"	1000	"	X		Dico 3 comp	"	X	X	X							
6.	"	1010	"	X		Dico 4 comp	"	X	X	X							11 Golden Shore Dr Long Beach, CA 90802
7.	"	1020	"	X		Dico 5 comp	"	X	X	X							
8.	"	1320	Soil		X	Dico #8	"	X	X	X							
9.	"	1330	"	X		Dico #9 comp	"	X	X	X							(562) 435-6188 (562) 435-6687 fax.
10.	"	1340	"	X		Dico #10 comp	8 oz + 4 oz	X	X	X	X						
11.	"	1420	"		X	Dico #12	8 oz	X	X	X							Please fax results when they are done.
12.	"	1400	"		X	Dico #11	8 oz	X	X	X							
13.	"	1410	"		X	Dico #15	"	X	X	X							
14.	"	1425	Sludge	X		Dico #13	"	X	X	X							
15.	"	1430	Soil		X	Dico #14	"	X	X	X							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	6/20/03 1530				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Received for Laboratory by: (Signature)	Date / Time	Temp.	Seals Intact (Y/N)	Condition / Remarks
	6/20/03 1530	4.8°C		

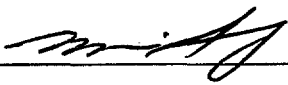
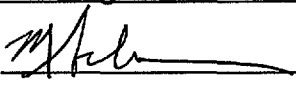
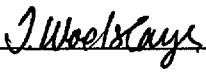
Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9- 00763

## ANALYTICAL DATA REVIEW SUMMARY

<b>Site Name:</b> Dico Oil <b>Project TDD Number:</b> 09-03-05-0002	<b>Location:</b> Signal Hill, California <b>PAN:</b> 0346.01.RS
<b>Laboratory:</b> EMAX Laboratories <b>Sampling Dates:</b> 06/20/03 <b>Analytical Method:</b> TPH /Diesel & Oil by EPA 8015M	<b>Lab Project Number:</b> 03F116 <b>Sample Matrix:</b> Soil <b>Data Reviewer:</b> Mindy Song

### REVIEW AND APPROVAL:

Data Reviewer: <u>Mindy C. Song</u> 	Date: <u>8/14/03</u>
Technical QA Reviewer: 	Date: <u>9-30-03</u>
Project Manager: <u>J. Wells</u> 	Date: <u>10/2/03</u>

### SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	Dico 1 comp	03F116-01
2	Dico 2 comp	03F116-02
3	Dico 6 comp	03F116-03
4	Dico 7 comp	03F116-04
5	Dico 3 comp	03F116-05
6	Dico 4 comp	03F116-06
7	Dico 5 comp	03F116-07
8	Dico#8	03F116-08
9	Dico #9 comp	03F116-09
10	Dico #10 comp	03F116-10
11	Dico#12	03F116-11
12	Dico#11	03F116-12
13	Dico#15	03F116-13
14	Dico#13	03F116-14
15	Dico#14	03F116-15
16		
17		
18		
19		
20		

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### DATA PACKAGE COMPLETENESS CHECKLIST:

#### Checklist Code:

☒ **X** Included: no problems  
☐ **\*** Included: problems noted in review  
☐ **O** Not Included and/or Not Available  
☐ **NR** Not Required  
☐ **RS** Provided As Re-submission

#### Case Narrative:

☒ **X** Case Narrative present

#### Quality Control Summary Package:

☒ **X** Data Summary sheets  
☒ **X** Matrix Spike/Spike Duplicate Recoveries  
☒ **X** Laboratory Control Sample Recoveries  
☒ **X** Method Blank Summaries  
☒ **X** Initial Calibration Data  
☒ **X** Continuing Calibration Data  
☐ **\*** Surrogate Compound Recovery Summary  
☐ **NR** Internal Standard Area Summary

#### Sample and Blank Data Package Section

☒ **X** Chromatograms  
☒ **X** Quantitation Reports

#### Raw QC Data Package Section

☒ **X** Quantitation Reports for Standards, LCS, and MS/MSD  
☐ **NR** List of Instrument Detection Limits  
☒ **X** Chain-of-Custody Records  
☒ **X** Sample Preparation and Analysis Run Logs

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 1. HOLDING TIMES

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.

#### Water Samples:

Purgeable analyses: 14 days (from collection) to analysis.

Extractable analyses: 7 days (from collection) to extraction; 40 days (from extraction) to analysis.

#### Soil or Other Matrices:

Purgeable analyses: 14 days (from collection) to analysis.

Extractable analyses: 14 days (from collection) to extraction; 40 days (from extraction) to analysis.

**Comments:** Soil samples were extracted 3 days from collection and analyzed 6 days from extraction.

### 2. INSTRUMENT PERFORMANCE CRITERIA

- ☐ **N/A** Raw data has been checked to verify that there is adequate resolution (>25%) between peaks of the standard compounds.
- ☐ **N/A** Raw data has been checked to verify that retention time windows are reported and that all standard compounds are within the windows.

**Comments:** N/A: Not Applicable



## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 3. INITIAL CALIBRATIONS

☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Unless flagged below, a 5-point initial calibration was run. In addition, average Relative Response Factor (RRF), and percent relative Standard Deviation (%RSD) values were within control limits (%RSD  $\leq$  20). For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the low calibration level was not detected, the nondetected results are qualified (UJ).

**Comments:** Percent relative standard deviation values for diesel and motor oil were within the control limits.

### 4. CONTINUING CALIBRATIONS

☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable

Unless flagged below, continuing calibrations were performed at the beginning and at the end of any group of samples and at least every 12 hours. In addition, Relative Response Factors (RRF), and Percent Difference (%D) values were within control limits (%D  $\leq$  15). For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the %D is very high and indicates a severe loss of instrument sensitivity, the associated nondetected results may be qualified as estimated (UJ) or rejected (R) based on the professional judgement of the reviewer.

**Comments:** None.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 5. LABORATORY CONTROL SAMPLE

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Laboratory Control Samples Analyzed

Laboratory control sample recoveries are used for a qualitative indication of accuracy (bias) independent of matrix effects. Spike recovery limits of 80% to 120% are specified in EPA/540/G-90/004. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). At the discretion of the reviewer, other limits may be used only if justification can be provided.

Comments: None.

### 6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

- ☒ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☐ No Matrix Spike/Matrix Spike Duplicates Analyzed

Matrix spike and matrix spike duplicate recoveries are used for a qualitative indication of accuracy (bias) due to matrix effects. The RPD between the recoveries is used for a qualitative indication of precision. Spike recovery limits of 80% to 120% are specified in EPA/540/G-90/004. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). At the discretion of the reviewer, other limits may be used only if justification can be provided.

Comments: Soil sample Dico #10 comp was used for MS/MSD and the recoveries were within the control limit.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 7. BLANKS AND BACKGROUND SAMPLES

☒ Acceptable  
☐ Detection Limits Adjusted

The following blanks were analyzed:

☒ Method (preparation) Blanks  
☐ Field Blanks  
☐ Instrument Blanks  
☐ Rinsate Blanks  
☐ Background Samples  
☐ VOA Trip Blanks

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments: No contamination was found in the method blank at reporting limit.

### 8. SURROGATE COMPOUNDS

☐ Acceptable  
☒ Acceptable with qualification  
☐ Unacceptable  
☐ No surrogates analyzed

Surrogate compound recoveries for samples analyzed within a sample group must be within the limits specified in the method. If the surrogate recovery is between 10% and the lower limit, the associated detected results are qualified as estimated (J) and the nondetected results are qualified as estimated (UJ). If the surrogate recovery is <10%, the associated detected results are qualified as estimated (J) and the nondetected results are rejected (R). If the surrogate recovery is above the upper limit, the associated detected results are qualified as estimated (J). Surrogate recoveries which exceeded these limits are noted below and the associated results are qualified on the attached sample report forms. If there are no limits specified in the method, laboratory limits based on historical performance may be used at the discretion of the reviewer.

Comments: All recoveries were within the control limit except <sup>for the</sup> following:

Surrogate compound (Hexacosane) recoveries of sample Dico 6 comp, Dico #9 comp and Dico#10 comp were above the upper limit due to matrix interference. Detected results for those samples were qualified as estimated (J). The surrogates were diluted out for sample Dico3, —

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

comp, Dico4 comp, Dico5 comp, Dico#8, Dico#11, Dico#15, Dico#13 and Dico#14.  
Qualification was not required because surrogates were diluted out of the samples.

### 9. INTERNAL STANDARDS

- ☐ Acceptable  
☐ Acceptable with qualification  
☐ Unacceptable  
☒ No internal standards analyzed

Internal Standard area counts for samples analyzed within a sample group must be within the range of 50% to 200% of the internal standard area for the continuing calibration. If the internal standard area is between 10% and 50% of this value, the associated detected results are qualified as estimated (J) and the nondetected results are qualified as estimated (UJ). If the internal standard area is <10% of the calibration area, both the detected and nondetected results are rejected (R). If the internal standard area is >200% of the calibration area, the associated detected results are qualified as estimated (J). Internal standards which exceeded these limits are noted below and the associated results are qualified on the attached sample report forms.

Comments: External standards were used.

### 10. DUPLICATE ANALYSES

- ☐ Acceptable  
☒ Acceptable with qualification  
☐ Unacceptable  
☐ No Duplicates Analyzed

Type of duplicates analyzed:

- ☒ Field Duplicates  
☐ Laboratory Duplicates

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the equation indicated below. Qualify the results as estimated (J) for any analyte whose RPD exceeds that specified in the Sampling and Analysis Plan.

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Comments: RPD of diesel for sample Dico#11 and Dico#15 (field duplicate of Dico#11) were greater than 50%, and the detected diesel results were qualified as estimated (J).

## ANALYTICAL DATA REVIEW SUMMARY

<b>Site Name:</b> Dico Oil	<b>Location:</b> Signal Hill, California
<b>Project TDD Number:</b> 09-03-05-0002	<b>PAN:</b> 0346.01.RS

	<u>Dico#11</u>	<u>Dico#15</u>	<u>RPD</u>
Diesel (mg/kg)	4,500	7,800	54
Motor Oil (mg/kg)	15,000	19,000	24

### 11. ANALYTE IDENTIFICATION

Verify that positive results have been confirmed on a dissimilar second column, that the sample chromatograms agree with the correct daily standard chromatograms, and that the retention time windows match.

**Comments:** Analyte identification is acceptable. Total petroleum hydrocarbon as diesel and motor oil were identified by the patterns of chromatograms and the retention time.

### 12. ANALYTE QUANTITATION

Confirm that analyte quantitation was performed correctly using the following formulas:

<b>Purgeable analyses, water samples:</b>	
$\mu\text{g/L} =$	$\frac{(\text{analyte area})(\text{amount of external standard, ng})}{(\text{external standard area})(\text{volume of water purged, mL})}$
<b>Purgeable analyses, soil samples:</b>	
$\mu\text{g/kg} =$	$\frac{(\text{analyte area})(\text{amount of external standard, ng})}{(\text{external standard area})(\text{weight of soil extracted, g})(\text{fraction solids})}$
<b>Extractable analyses, water samples:</b>	
$\mu\text{g/L} =$	$\frac{(\text{analyte area})(\text{amount of external standard, ng})(\text{total volume of extract, }\mu\text{L})}{(\text{external standard area})(\text{volume of sample extracted, mL})(\text{injection volume, }\mu\text{L})}$
<b>Extractable analyses, soil samples:</b>	
$\mu\text{g/kg} =$	$\frac{(\text{analyte area})(\text{amount of external standard, ng})(\text{total volume of extract, }\mu\text{L})}{(\text{external standard area})(\text{weight of sample extracted, g})(\text{fraction solids})(\text{injection volume, }\mu\text{L})}$

**Comments:** Analyte quantitation is acceptable. Some of samples had a mixture of diesel and motor oil. Diesel was quantitated from C10 to C16, and the motor oil was quantitated from C16 to C34.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil	Location: Signal Hill, California
Project TDD Number: 09-03-05-0002	PAN: 0346.01.RS

### 13. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

☐ Acceptable  
☒ Acceptable with Qualification  
☐ Rejected

Accepted data meet the minimum requirements for the following EPA data category:

☐ ERS Screening  
☐ Non-definitive with 10 % Conformation by Definitive Methodology  
☐ Definitive, Comprehensive Statistical Error Determination was performed.  
☒ Definitive, Comprehensive Statistical Error Determination was not performed.

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

**Comments:** Data as reported is valid.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil

Location: Signal Hill, California

Project TDD Number: 09-03-05-0002

PAN: 0346.01.RS

### 14. USABILITY OF DATA

**A. These data are considered usable for the following the data use objectives stated in the EMERGENCY RESPONSE OFFICE AND SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START) QUALITY ASSURANCE SAMPLING PLAN FOR SOIL, DEBRIS AND WATER SAMPLING, DICO OIL, SIGNAL HILL, JUNE 19, 2003 (QASP)**

The following data use objectives were indicated in the QASP:

TO BE COMPARED WITH FEDERAL OR STATE OCCUPATIONAL HEALTH LIMITS (ON-SITE HEALTH AND SAFETY ASSESSMENT DATA).

TO BE COMPARED WITH OR OTHER RISK-BASED ACTION LEVELS (E.G. EPA PRELIMINARY REMEDIAL GOALS) TO DETERMINE IF CHRONIC HEALTH THREATS EXIST.

THE DATA ARE USABLE FOR THE ABOVE OBJECTIVES.

**B. These data meet quality objectives stated in the SAP.**

AS INDICATED IN SECTION 2.2 OF THE QASP, THE INVESTIGATION WILL GENERATE DEFINITIVE DATA AND TABLE E OF THE QASP OUTLINES THE DATA QUALITY INDICATOR GOALS APPLICABLE TO THE DEFINITIVE DATA QUALITY LEVEL. THE DATA IN THIS PACKAGE MEET THESE REQUIREMENTS.

### 15. DOCUMENTATION OF LABORATORY CORRECTIVE ACTION

**Problem:** No problems requiring corrective action were found.

**Resolution:** Not required.

## ANALYTICAL DATA REVIEW SUMMARY

Site Name: Dico Oil	Location: Signal Hill, California
Project TDD Number: 09-03-05-0002	PAN: 0346.01.RS

### APPENDIX A. ANNOTATED DATA SUMMARY SHEETS

Attached are copies of all data summary sheets, with data qualifiers indicated (hand-annotated), and a copy of the chains of custody for the samples.

When appropriate, the practical quantitation limits have been adjusted to reflect the qualifications noted during the data validation. Errors in the reporting of detected results will not usually be changed by hand. In these cases, the laboratory may be required to re-submit the affected data summary sheets and any associated portions of the data package.

The following data validation qualifiers may be used in this review. Their definitions are taken from the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required practical quantitation limits or because quality control criteria were not met.
- R** The sample results are rejected (analyte may or may not be present) due to gross deficiencies in quality control criteria. Any reported value is unusable. Resampling and/or reanalysis is necessary for verification.
- U** The material was analyzed for, but not detected. The associated numerical value is the sample practical quantitation limit or adjusted sample practical quantitation limit.
- UJ** The material was analyzed for, but not detected. The reported practical quantitation limit is estimated because quality control criteria were not met.
- NJ** Presumptive evidence of the presence of the material (tentatively identified compound) at an estimated quantity.



METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

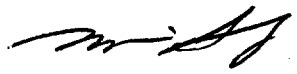
```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID:  DICO 1 COMP                   Date Analyzed: 06/26/03 07:32
Lab Samp ID: F116-01                     Dilution Factor: 1
Lab File ID: TF24066A                    Matrix       : SOIL
Ext Btch ID: DSF020S                     % Moisture    : 5.2
Calib. Ref.: TF24064A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	2.1
MOTOR OIL	380	53	2.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	114	45-165
HEXACOSANE	133	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane

  
 8/5/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Patch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID   : DICO 2 COMP                  Date Analyzed: 06/26/03 08:14
Lab Samp ID : F116-02                     Dilution Factor: 1
Lab File ID : TF24067A                    Matrix       : SOIL
Ext Btch ID : DSF020S                     % Moisture    : 11.8
Calib. Ref. : TF24064A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	2.3
MOTOR OIL	440	57	2.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	115	45-165
HEXACOSANE	143	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane

*mia*  
8/5/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 17:50  
Sample ID: DICO 6 COMP Date Analyzed: 06/26/03 22:50  
Lab Samp ID: F116-03T Dilution Factor: 3  
Lab File ID: TF24088A Matrix : SOIL  
Ext Btch ID: DSF020S % Moisture : 4.7  
Calib. Ref.: TF24080A Instrument ID : GCT050  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	31	6.3
MOTOR OIL	3100 J	160	6.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	126	45-165
HEXACOSANE	337*	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

\* : Out of QC limits due to matrix interference

*Mr. AJ*  
8/15/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
Batch No.	: 03F116	Date Extracted:	06/23/03 17:50
Sample ID:	DICO 7 COMP	Date Analyzed:	06/26/03 09:37
Lab Samp ID:	F116-04	Dilution Factor:	1
Lab File ID:	TF24069A	Matrix	: SOIL
Ext Btch ID:	DSF020S	% Moisture	: 3.5
Calib. Ref.:	TF24064A	Instrument ID	: GCT050

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	2.1
MOTOR OIL	1500	52	2.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	119	45-165
HEXACOSANE	173	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

*m. J.*  
8/5/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID   : DICO 3 COMP                  Date Analyzed: 06/26/03 23:32
Lab Samp ID : F116-05T                    Dilution Factor: 50
Lab File ID : TF24089A                    Matrix       : SOIL
Ext Btch ID : DSF020S                     % Moisture    : 2.5
Calib. Ref. : TF24080A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	510	100
MOTOR OIL	16000	2600	100

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane  
 DO : Diluted out

*m-af*  
8/12/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====

Client	: ECOLOGY AND ENVIRONMENT	Date Collected:	06/20/03
Project	: DICO SIGNAL HILL	Date Received:	06/20/03
Batch No.	: 03F116	Date Extracted:	06/23/03 17:50
Sample ID:	DICO 4 COMP	Date Analyzed:	06/27/03 00:13
Lab Samp ID:	F116-06T	Dilution Factor:	100
Lab File ID:	TF24090A	Matrix	: SOIL
Ext Btch ID:	DSF020S	% Moisture	: 2.9
Calib. Ref.:	TF24080A	Instrument ID	: GCT050

=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	1000	210
MOTOR OIL	28000	5100	210

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane  
DO : Diluted out

*m. j.*  
8/13/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID   : DICO 5 COMP                  Date Analyzed: 06/27/03 00:55
Lab Samp ID : F116-07T                    Dilution Factor: 100
Lab File ID : TF24091A                    Matrix       : SOIL
Ext Btch ID : DSF020S                     % Moisture    : 2.4
Calib. Ref. : TF24080A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	1000	200
MOTOR OIL	34000	5100	200

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane  
  
 DO : Diluted out

*Mr. J*  
8/12/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 17:50  
Sample ID: DICO #8 Date Analyzed: 06/27/03 01:36  
Lab Samp ID: F116-08T Dilution Factor: 100  
Lab File ID: TF24092A Matrix : SOIL  
Ext Btch ID: DSF020S % Moisture : 4.7  
Calib. Ref.: TF24080A Instrument ID : GCT050

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	1000	210
MOTOR OIL	31000	5200	210

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

DO : Diluted out

*m. A.*  
8/12/03

5018



METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID:  DICO #9 COMP                   Date Analyzed: 06/27/03 03:41
Lab Samp ID: F116-09T                     Dilution Factor: 5
Lab File ID: TF24095A                     Matrix          : SOIL
Ext Btch ID: DSF020S                       % Moisture      : 4.2
Calib. Ref.: TF24093A                     Instrument ID   : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	52	10
MOTOR OIL	7300 J'	260	10

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	134	45-165
HEXACOSANE	574*	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

\* : Out of QC limits due to matrix interference

*Mr. J*  
8/5/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID   : DICO #10 COMP                Date Analyzed: 06/26/03 13:48
Lab Samp ID : F116-10                     Dilution Factor: 1
Lab File ID : TF24075A                    Matrix          : SOIL
Ext Btch ID : DSF020S                     % Moisture      : 19.0
Calib. Ref. : TF24064A                    Instrument ID   : GCT050
=====

```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	12	2.5
MOTOR OIL	2100 J	62	2.5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	121	45-165
HEXACOSANE	244*	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

\* : Out of QC limits due to matrix interference

*Mr. Af*  
8/5/03

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 17:50  
Sample ID: DICO #12 Date Analyzed: 06/26/03 18:41  
Lab Samp ID: F116-11 Dilution Factor: 1  
Lab File ID: TF24082A Matrix : SOIL  
Ext Btch ID: DSF020S % Moisture : 6.6  
Calib. Ref.: TF24080A Instrument ID : GCT050  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	2.1
MOTOR OIL	220	54	2.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	115	45-165
HEXACOSANE	115	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

*m-af*  
8/5/03

5024

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 17:50  
Sample ID: DICO #11 Date Analyzed: 06/29/03 11:06  
Lab Samp ID: F116-12T Dilution Factor: 10  
Lab File ID: TF27062A Matrix : SOIL  
Ext Btch ID: DSF020S % Moisture : 19.2  
Calib. Ref.: TF27060A Instrument ID : GCT050

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	4500	120	25
MOTOR OIL	15000	620	25

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

DO : Diluted out

*M. J.*  
8/12/03

5026

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/23/03 17:50  
Sample ID: DICO #15 Date Analyzed: 06/29/03 14:35  
Lab Samp ID: F116-13T Dilution Factor: 10  
Lab File ID: TF27067A Matrix : SOIL  
Ext Btch ID: DSF020S % Moisture : 19.2  
Calib. Ref.: TF27060A Instrument ID : GCT050  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	7800	120	25
MOTOR OIL	19000	620	25

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

DO : Diluted out

*Amity*  
8/12/03

5028

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====  
Client : ECOLOGY AND ENVIRONMENT Date Collected: 06/20/03  
Project : DICO SIGNAL HILL Date Received: 06/20/03  
Batch No. : 03F116 Date Extracted: 06/24/03 16:30  
Sample ID: DICO #13 Date Analyzed: 06/27/03 04:23  
Lab Samp ID: F116-14T Dilution Factor: 1000  
Lab File ID: TF24096A Matrix : SLUDGE  
Ext Btch ID: DSF021S % Moisture : NA  
Calib. Ref.: TF24093A Instrument ID : GCT050  
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	24000	10000	2000
MOTOR OIL	680000	50000	2000

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
SURRE1 : Bromobenzene  
SURRE2 : Hexacosane

DO : Diluted out

*mif*  
8/12/03

5030

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

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=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: 06/20/03
Project     : DICO SIGNAL HILL             Date Received: 06/20/03
Batch No.   : 03F116                      Date Extracted: 06/23/03 17:50
Sample ID:  DICO #14                      Date Analyzed: 07/02/03 17:09
Lab Samp ID: F116-15T                    Dilution Factor: 1000
Lab File ID: TG02005A                    Matrix       : SOIL
Ext Btch ID: DSF020S                     % Moisture    : 29.1
Calib. Ref.: TG02003A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	14000	2800
MOTOR OIL	58000	71000	2800

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	DO	45-165
HEXACOSANE	DO	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane

DO : Diluted out

*m-j*  
8/12/03

5032

METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client   : ECOLOGY AND ENVIRONMENT      Date Collected: NA
Project  : DICO SIGNAL HILL             Date Received: 06/23/03
Batch No. : 03F116                     Date Extracted: 06/23/03 17:50
Sample ID: MBLK1S                      Date Analyzed: 06/23/03 18:16
Lab Samp ID: DSF020SB                 Dilution Factor: 1
Lab File ID: TF23004A                 Matrix       : SOIL
Ext Btch ID: DSF020S                  % Moisture    : NA
Calib. Ref.: TF23002A                 Instrument ID : GCT050
=====

```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	2
MOTOR OIL	ND	50	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	107	45-165
HEXACOSANE	87	27-176

```

RL      : Reporting Limit
SURRE1  : Bromobenzene
SURRE2  : Hexacosane
Parameter H-C Range
Diesel    C10-C24
Motor Oil C18-C34

```

*Handwritten signature*  
8/5/03

5035



METHOD M8015  
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : ECOLOGY AND ENVIRONMENT      Date Collected: NA
Project     : DICO SIGNAL HILL             Date Received: 06/24/03
Batch No.   : 03F116                      Date Extracted: 06/24/03 16:30
Sample ID   : MBLK2S                      Date Analyzed: 06/26/03 03:23
Lab Samp ID : DSF021SB                    Dilution Factor: 1
Lab File ID : TF24060A                    Matrix       : SOIL
Ext Btch ID : DSF021S                     % Moisture    : NA
Calib. Ref. : TF24054A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	2
MOTOR OIL	ND	50	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOBENZENE	119	45-165
HEXACOSANE	101	27-176

RL : Reporting Limit  
 SURR1 : Bromobenzene  
 SURR2 : Hexacosane  
 Parameter H-C Range  
 Diesel C10-C24  
 Motor Oil C18-C34

*[Signature]*  
8/5/03

5037

B13

# CHAIN OF CUSTODY RECORD

PROJ. NO. 0346.01.RS		PROJECT NAME Dico Signal Hill				NO. OF CON- TAINERS	REMARKS			
SAMPLERS: (Signature) C. Nelson										
DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION					
1.	6/20/03 0900	Soil	X		Dico 1 comp	8 oz	X	X	X	
2.	" 0910	"	X		Dico 2 comp	"	X	X	X	
3.	" 0920	"	X		Dico 6 comp	"	X	X	X	
4.	" 0930	"	X		Dico 7 comp	"	X	X	X	
5.	" 1000	"	X		Dico 3 comp	"	X	X	X	
6.	" 1010	"	X		Dico 4 comp	"	X	X	X	
7.	" 1020	"	X		Dico 5 comp	"	X	X	X	
8.	" 1320	Soil		X	Dico #8	"	X	X	X	
9.	" 1330	"	X		Dico #9 comp	"	X	X	X	
10.	" 1340	"	X		Dico #10 comp	8 oz + 4 oz	X	X	X	X
11.	" 1420	"		X	Dico #12	8 oz	X	X	X	
12.	" 1400	"		X	Dico #11	8 oz	X	X	X	
13.	" 1410	"		X	Dico #15	"	X	X	X	
14.	" 1425	Sludge	X		Dico #13	"	X	X	X	
15.	" 1430	Soil		X	Dico #14	"	X	X	X	

Relinquished by: (Signature) *[Signature]* 6/20/03 1530

Relinquished by: (Signature)

Date / Time

Date / Time

Received by: (Signature)

Received by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Date / Time

Date / Time

Received by: (Signature)

Received by: (Signature)

Sealed for Laboratory by: (Signature) *[Signature]* 6/20/03 1530

Temp. 4.8°C

Seals Intact (Y/N) ☒

Condition / Remarks

CAM Metals  
 PCB's by 8082  
 TPH / Diesel #01  
 MS + MSD

03 F116

Send the report  
 to Ben Castellana  
 Ecology & Environment  
 11 Golden Shore Dr  
 Long Beach, CA 90802  
 (562) 435-6188  
 (562) 435-6687  
 Fax.  
 Please fax results  
 when they are done.

3003